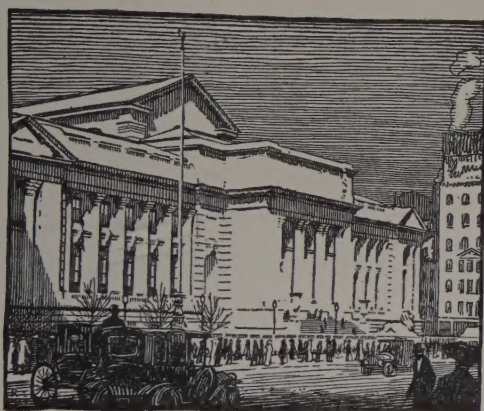


BULLETIN

OF THE

NEW YORK PUBLIC LIBRARY

ASTOR, LENOX AND TILDEN FOUNDATIONS



SEPTEMBER 1927

VOLUME 31 - - - NUMBER 9

A RAMBLING NOTE ON THE "RUSSIAN COLUMBUS" - - - -	707
NEWS OF THE MONTH - - - - -	714
NEW PERIODICALS - - - - -	716
STARCHES, 1811-1925. PART VIII. (<i>Conclusion</i>) - - - -	718
INTERESTING RECENT ADDITIONS - - - - -	788
CIRCULATION STATISTICS FOR THE MONTH OF AUGUST - - -	798
PRINCIPAL DONORS IN AUGUST - - - - -	799
PUBLICATIONS OF THE NEW YORK PUBLIC LIBRARY - - - -	800

NEW YORK
1927.

PRINTED AT THE NEW YORK PUBLIC LIBRARY

form p5 [ix-1-27 1650]

THE Bulletin is published monthly by The New York Public Library at 476 Fifth Avenue, New York City. Subscription \$1.00 a year, current single numbers 10 cents. Entered at the Post Office at New York, N. Y. as second-class matter, February 10, 1897, under Act of July 16, 1894. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized. Printed at The New York Public Library, 476 Fifth Avenue. September, 1927. Volume 31, Number 9.



NIKOLAI PETROVICH REZANOV

BULLETIN
OF THE
NEW YORK PUBLIC LIBRARY

ASTOR, LENOX AND TILDEN FOUNDATIONS

VOLUME 31

SEPTEMBER, 1927

NUMBER 9

A RAMBLING NOTE ON THE "RUSSIAN COLUMBUS"

NIKOLAI PETROVICH REZANOV

By AVRAHM YARMOLINSKY

Chief of the Slavonic Division

SOME months ago the Library received a prospectus announcing "the first issue of the first printing in English of the Rezanov voyage to Nueva California in 1806." The pamphlet reproduced the title-page of the forthcoming book and gave the printer's foreword. The title-page told that the work was a translation of the report of "Count Nikolai Petrovich Rezanov" concerning his voyage to New California from New Archangel, and that its English rendering was revised and corrected, as well as supplied with notes, by the printer and publisher of the book, Thomas C. Russell, of San Francisco. The foreword purported to tell "how this volume came to be printed," but it managed to reveal merely that the work was "now presented topographically in English for the first time," that it was dated at Sitka (New Archangel), June 17, 1806 (Old Style), and that there existed in the Academy of Pacific Coast History at Berkeley a defective translation of it by an Ivan Petrov. The announcement imparted the further information that this was to be an edition limited to 260 numbered and signed copies, and incidentally mentioned the price. The cover bore this fetching legend: "The Romance of Hispanic California. The story of Count Rezanov and Doña Concepción Argüello."

In due time there appeared a "preliminary descriptive circular" of the volume. The verso of the title-page of this pamphlet enquires, in syllables

not unworthy of the tabloids: "Would Rezanov have wed her?" and supplies "What the historians have to say" (which is practically nothing) and also "What Rezanov himself has written," to wit: "The Report of Nikolai Petrovich Rezanov to Count Nikolai Petrovich, the Russian Minister of Commerce." The circular exhibits, among other sample pages, Bret Harte's poem, "Concepción Argüello."

A search of bibliographical sources showed no published account by Rezanov of the voyage to New California. True, in Chapter 4 of his "History of California," Bancroft writes: "The best and most complete authority on this expedition (to New California) and the attending negotiations is *Rezanov, Zapiski*, pages 253-277, being the chamberlain's letter, dated New Archangel, June 17, 1806 . . ." ("The Works of Hubert Howe Bancroft," San Francisco, 1885, v. 19, p. 67.) Far from clearing up the mystery of the report, this reference of Bancroft's to a work by Rezanov, entitled "*Zapiski*," served to cloud it, since no such title was found in Russian bibliographical lists. An inquiry at the library of the Academy of Sciences at Leningrad brought the reply that Rezanov's "*Zapiski*" had appeared in the review "Otechestvennyia zapiski" for 1822-25. Examination of the file showed that the magazine contained, not "*Zapiski*," but another work entitled "Pervoye puteshestviye rossiyan okolo svyeta" (The first voyage of Russians around the world), of which more later. Suffice it to say here that it contains no report of Rezanov's trip to New California.

In the meantime a copy of Mr. Russell's publication arrived — and the puzzle was unraveled. A statement on page 7 gives away the fact that the text was translated from volume 2 of Tikhmenev's well-known history of the Russian-American Company ("Istoricheskoye obozryeniye obrazovaniya Rossiisko-Amerikanskoy Kompanii"), printed at St. Petersburg in two octavo volumes in 1861-63. With some effort the original of Mr. Russell's text was discovered among the appendices to volume 2 (p. 253-283). It proved to be a letter addressed by Rezanov to the Russian Minister of Commerce; in other words, the document drawn upon by Bancroft in his "History of California." And then came a communication from the Bancroft Library at Berkeley which completely cleared up the matter. It appears that what Bancroft called *Zapiski* are Rezanov's letters, which are printed in the appendix to Tikhmenev's work, and which were translated for Bancroft's use, together with the rest of the work, by the Ivan Petrovich mentioned above. This translation in manuscript is kept in the Bancroft Library. Dissatisfied with Petrov's rendering of Rezanov's report, Mr. Russell had it revised and now offers it to the public.

The revised translation is complete except for two short passages. The omission of a long postscript beginning, "Your Serenity will laugh, of course, to say that we owe our prosperity here largely to the fair sex," might be justified on the ground that it does not deal with Rezanov's trip to California, but it has a distinct value as furnishing curious details relating to the life of Russian settlements in North America. The rendering is competent, its curious feature being the abundance of Spanish phrases. *Port* is *puerto*, *governor* is *gobernador*, *commandant* is *commandante*; for "this old man" the translator substitutes "this venerable don"; "San Francisco missionaries" rendered "the *missionero padres* of the *Misión San Francisco de Asis*"; Rezanov's homely "For God's sake" becomes "Por Dios."

To the text of Rezanov's letter are appended three notes, one of which is the nature of a biographical sketch of that gentleman. The scholarship displayed therein might be described as casual. For instance, Mr. Russell tells us that Emperor Paul, "on August 11, 1799, confirmed by imperial ukase the consolidation of the United American Company under the title of the Russian-American Company" (p. 82). The facts of the matter, as expounded by Nikhmenov, are somewhat different. The consolidation, which took place on August 20, 1797, was confirmed by the Government on August 3, 1798, while the title "Russian-American Company" was bestowed upon the corporation by special imperial ukase issued on June 8, 1799, the Government granting the company its statutes and privileges by an act of July 8, the same year. In some dates are given according to Old Style, others according to New Style. Thus the date of the sailing of Rezanov's ships from Kronstadt is given according to the Gregorian calendar, while the date of his death is according to the Julian calendar. But this one has to discover for oneself. Even an unpretending reader would be nonplussed not to find in this sketch so relevant a detail as the date of the man's birth. Further, we are informed that Rezanov's letter was addressed to the Minister of Commerce, but we never learn his name, a fact which is the more surprising since he was the famous statesman and patron of arts and sciences, Nikolai Petrovich Rumiantzov, Director of the Museum in Moscow which bore his name until the death of Rezanov when the Rumiantzov Museum was transformed into the Lenin National Library. The letter is addressed familiarly to Count Nikolai Petrovich, and the editor seems to have taken Petrovich for Count Rumiantzov's family name.

Now, one wonders, did the editor come to evolve the notion that Rezanov was a Count, the rank which the title-page, the list of illustrations, the editor's Foreword, the biographical note, all agree in bestowing upon him?

Rezanov, though he enjoys that title in Bret Harte's poem, "Concepción Argüello," was not a count. Nor, for that matter, was he one of "the ten barons of Russia," as the Encyclopaedia Britannica would have us believe. He did not belong to the titled nobility. Mrs. Gertrude Atherton, the author of the Britannica article, gives as her authority Langsdorff's Travels, presumably "Voyages and Travels in various parts of the World during the years 1803, 1804, 1805, 1806 and 1807," London, 1813. Here, indeed, our man is often referred to as Baron von Resanoff. Her error can obviously be traced to this source. The German original, however, published in Frankfort in 1812, shows that throughout the volume Langsdorff, who was our traveler's body physician, refers to him correctly as either Herr or Kammerher von Resanoff (the title of chamberlain was granted him on June 10, 1803, just before he set out on his expedition). It was evidently the English translator who exalted the Russian with a stroke of the pen.

Certain passages of Rezanov's letter to Rumiantzov need elucidation, which the editor, however, fails to supply. Thus, for instance, Rezanov writes: "Even under favorable conditions it had been my intention to explore the Columbia River, but as in my last report to the General Administration I have fully gone into this matter, I need now but merely refer you thereto." (p. 6.) This intention to explore the Columbia River becomes intelligible if we consider that in his secret report to the directors of the Russian-American Company, dated New Archangel, February 15, 1806, the eager empire builder suggested the desirability of colonizing the valley of the Columbia River and of using it as a base for further expansion. "Should we be enabled to take the first steps in this direction," Rezanov wrote, "I dare say that we shall be in a position to attract colonists to Columbia from various places, and that within ten years we shall grow so strong that at the first ever so slightly favorable conjuncture of political circumstances in Europe it will be possible to add the California littoral to Russian possessions." (Tikhmenev, *op. cit.* v. 2, p. 233.)

One more word on Mrs. Atherton's article about Rezanov in the Britannica. Among other authorities she cites: "Rezánov-Zapisky Correspondence," a title which is also listed in the bibliography appended to her novel "Rezánov" with the further note: "(Russian Archives)." This is, according to her own statement in a recent letter to the Library, the very work used by Bancroft; in other words, Rezanov's letters and reports appearing in the appendix to Tikhmenev's monograph. There are indications that Mrs. Atherton has actually perused the manuscript. Apparently misled by the last syllable, she seems to have taken *zapiski* (Russian for *notes* or *memoirs*) as a proper noun,

thought that the manuscript in the Bancroft Library was the correspondence between our man and a Mr. Zapiski. In the Encyclopaedia article the st, assisted by the proofreader, becomes Mr. Zapinski. "His (Rezanov's) correspondence with the company, and with Zapinsky, etc." In a dull world should be grateful for such entertaining errors.

The Britannica* further states that Rezanov "was also the author of a lexicon of the Japanese language and of several other works, which are preserved in the library of the St. Petersburg Academy of Sciences, of which he was a member." The above mentioned letter of the Director of the library of the Leningrad Academy told that the Asiatic Museum of that Academy is in possession of two neatly copied manuscripts bound in morocco, being "a dictionary of the Japanese Language" and a "Guide to the Knowledge of Japanese Language," both by Rezanov. It has been stated that he learned the tongue from the Japanese seamen whom he took with him to their own country for repatriation, when he went there as the first Russian envoy to the court of the Mikados. (Metropolitan Yevgeni, "Slovar russkikh svyetskikh slovar" . . . "Moscow, 1845, v. 2, quoted in "Russki biograficheski slovar," Rezanov, St. Petersburg, 1910, p. 541.) Curiously enough, these sailors make no mention of that fact in the diary which they kept aboard Rezanov's ship, and excerpts from which were published some years ago. (See the Russian translation of the journal in "Istoricheski Vestnik," v. 73, 1898, 193-210.)

The well-known bibliographer, G. Gennadi, is authority for the statement that Rezanov compiled "dictionaries of the dialects of the tribes of Northern Asia" ("Spravochnyi slovar o russkikh pisatelyakh i uchenykh," Moscow, 1908, v. 3, p. 291), and Tikhmenev has it that one of Rezanov's instructions, when he inspected the Russian colonies in North America, was that the colony should study the language of the natives. "To assist them in this task Rezanov took upon himself the collection of native words for a dictionary which he afterwards turned over to the Administration (of the Russian-American Company) with a request to print the work and sell it to those traveling to America, for the benefit of the colonial schools." (Tikhmenev, *cit.* v. 1, p. 141-42.) The Director of the Library of the Russian Academy could give no information concerning this work. What has become of the manuscript?

Rezanov seems to be the author of only one published work, *i. e.*, the first voyage," which was mentioned above. It is very little known. Thus it does not figure in the bibliography attached to the section on the "Discoveries of Russians in the Pacific Ocean," which is part of a volume

presented last year by the Leningrad Academy of Sciences to the Third Pan-Pacific Congress. ("Tikhi okean," Leningrad, 1926; also an English translation, same place, same date.) Although distinctly inferior in point of scientific importance and interest to the other descriptions of the first Russian circumnavigation of the globe, Rezanov's journal should find a place beside the memoirs of Krusenstern ("Puteshestviye vokrug svyeta . . . na korablyakh Nadezhdye i Nevye," St. Petersburg, 3 v., 1809-1812; there is an English translation), Langsdorff, Lisianski ("Puteshestviye vokrug svyeta . . . na korablye Nevye," St. Petersburg, 1812) and Shemelin (Zhurnal pervogo puteshestiya rossiyan vokrug zemnovo shara . . . " St. Petersburg, 2 v., 1816-1818).

Rezanov's "First Voyage" appeared in thirteen instalments in the St. Petersburg review, "Otechestvennyia Zapiski" (1822, v. 10, p. 194-219; v. 11, p. 90-144; v. 12, p. 196-211, 359-374; 1823, v. 14, p. 25-37, 328-350; v. 15, 248-274; 1824, v. 20, 131-163, 204-225; 1825, v. 23, 173-188, 366-396; v. 24, 73-96, 242-253). The text is preceded by an editorial note containing the following statement: "He (Rezanov) left behind him many curious memoirs, including the present journal, which was prepared by him as a report on his appointed task. Passages from it will be all the more entertaining to the curious reader and all the more precious for the history of our fatherland." The printed text, therefore, is but a set of excerpts from a larger work which has never been published in full. It is not known where the original manuscript is to be found. An article on Rezanov in the Russian Biographical Dictionary states, following Gennadi, that it is kept at the Library of the Russian Academy of Sciences, but the Director of that Library, in the letter referred to above, declares that "the original is not in the library nor in the Museum of the Academy of Sciences, nor does it figure in the catalogues of the Academy's archives." The published section of the journal, six chapters in all, begins with a brief sketch of the history of the Russian-American Company and an account of how the expedition was fitted out. It continues with the story of the expedition's visit to Copenhagen and England, some pages being given over to interesting observations on London. Then the diarist deals with the Canary Islands, the crossing of the equator — the first in the history of Russian navigation — the island of Santa Catharina off the shore of Brazil, the rounding of Cape Horn and the Marquesas. The text ends abruptly at the point where the two ships under Rezanov's nominal command part company off the Sandwich Islands. The journal corresponds to Chapters 1 to 8, volume 1, of Langsdorff's account, and to the first 10 chapters of Krusenstern's. Rezanov is not so technical as Krusenstern, not so

tematic as Langsdorff, and on the whole less competent than either. Throughout his writing is that of a dilettante, interested, shrewd, humane, patriotic.

One passage in Rezanov's "First Voyage" calls into question a statement made by Bancroft in his "History of Alaska." "Previous to his departure from St. Petersburg," the historian writes, "he (Rezanov) received portraits of the imperial family and of scientific men, the latter presenting their likenesses 'with the sole object of awakening in the untutored mind of the American savage an understanding of true art.' One of these donations was made by State Councillor von Fuchs, Director of the Moscow Academy of Sciences, who accompanied his gift with a letter in which he speaks of Rezanov as the 'worthy successor of all the great discoverers of the world — the Russian Columbus.' " ("The Works of Hubert Howe Bancroft," San Francisco, 1886, v. 37, p. 449, footnote.) Now, there has never been an Academy of Sciences in Moscow and no von Fuchs appears among the members of the Academy of Sciences of St. Petersburg. Furthermore, Rezanov, in his journal, does speak of certain gifts which he received before he left Russia and which were to be deposited in the American Museum at Kadiak, "to be to future generations an unforgettable memento of those who were the first to interest themselves in enlightening that country (America)." (*Ot. Zap.* v. 10, p. 215.) He mentions among these presents a collection of "classical books and maps" given by Novosiltzov; pictures, posters, prints and drawings presented by Strogonov "to introduce the youth to a taste for the arts"; models and drawings of boats fit to sail the American waters, donated by Admiral Michagov; and "an excellent collection of travel books and practical manuals" coming from Rumiantzov. Nothing is said, however, about any portraits of "the imperial family and scientific men" or to the State Councillor von Fuchs.

NEWS OF THE MONTH

GIFTS

DURING the month of August, 1927, there were received as gifts 4,364 volumes, 9,391 pamphlets, 452 maps, and 6 prints. Some interesting items were the following:

From the American Art Association came a collection of priced catalogues of auction sales held there during 1926 and 1927 — 41 volumes and 41 pamphlets. From the Estate of Arianna S. Foshay came two bound volumes of newspapers containing issues of the *Connecticut Gazette*, New London, 1795-1797; *Greenleaf's New York Journal & Patriotic Register*, 1799-1800; and of the *Republican Watch-Tower*, New York, 1800-1801. The Neighborhood Playhouse gave the Library a collection of books of clippings on theatrical subjects, programmes, playbills, etc. (10 volumes and 4 pamphlets).

From Mr. Selden C. Fox, Executor of the Estate of Charles L. Fox, South Portland, Maine, came a copy of the privately printed volume, "The Work of Charles Lewis Fox 1854-1927," 1927. From the International Silver Company, Meriden, Conn., came 2 volumes and 3 pamphlets relating to modern silverware. The Tokyo Asahi & The Osaka Asahi, Osaka, Japan, gave a copy of "Present-day Japan; English Supplement of The Osaka Asahi and The Tokyo Asahi, 1927, at the Opening of a New Reign."

Interesting collections were received from the following: Mr. Edward D. Coleman (28 volumes relating to Jewish subjects); Senhor João da Matta Simoes, Sergipe, Brazil (5 volumes and 6 pamphlets relating to Brazil); Mrs. George W. Smith (21 volumes, 14 pamphlets, 141 maps); Miss Jean Sneddon (55 volumes and 2 pamphlets, including "The Opening of Tibet," by Perceval Landon, New York, 1906; "Civilization, an appreciation of the victories of scholarship, science and art," 6 vols., New York, n. d.; "Trans-Himalaya discoveries and adventures in Tibet," by Sven Hedin, 3 vols., London, 1910-1913; "Glimpses of Unfamiliar Japan," by Lafcadio Hearn, 2 vols., Boston, [c. 1894]).

The following interesting works were received as gifts from the authors: From Dr. L. C. Barnes, Yonkers, N. Y., his works — "The John Gano Evidence of George Washington's Religion" and "Two Thousand Years of Missions before Carey . . ." — and two works by Mary Clark Barnes; from Mr. Herbert Campbell, Kyrenia, Cyprus, "Further Notes on the Campbells of Duntroon etc.," part II [Exeter, 1921], and "The Manuscript History of

gnish" by Alexander Campbell . . . edited by Herbert Campbell, re-
 ted 1926; from Mr. Lincoln H. Cha, Peking, China, a work on the Tsing
 a College Library, in Chinese; from Mr. Rudolf A. Clemen, Chicago,
 ttle trails as a factor in the development of Livestock Marketing" [Re-
 t from *Journal of Farm Economics*, Oct., 1926]; from Mrs. Helen M.
 ke, Hawley, Pennsylvania, "Traditions of Wallenpaupack," Hawley,
 n., [c. 1926]; from Mr. Jacob de Haas, the two volumes (autographed)
 is "Theodor Herzl, a Biographical Study . . .," New York, 1927; from
 John de Kay, "Mexico, the Problem and the Solution," Washington
 1927]; from Mr. Edward Jerome Dies, Chicago, "Solving the Farm
 dle," Chicago [1926]; from Miss Marian Cole Fisher, St. Paul, Minne-
 , "Marian Cole Fisher Handbook of Cookery," St. Paul [c. 1927]; from
 John W. Howell and Mr. Henry Schroeder, Schenectady, N. Y., "His-
 of the Incandescent Lamp," Schenectady, N. Y., 1927; from Mr. Li
 -Yuen, Nanking, China, "A Proposed National System of Libraries for
 na," in Chinese, mimeographed, Nanking, China, April, 1927; from Mr.
 rles Martyn, "The Wine Steward's Manual," New York [c. 1903];
 ods and Culinary Utensils of the Ancients . . .," New York; "Memoir
 Artemas Ward," Boston, 1926 (reprinted 1926), and works on dietetics
 other authors; from Dr. Sidney A. Reeve, Staten Island, New York, the
 ed manuscript of his "Evolution of Social Crises, History as a Natural
 nomenon," vol. 1; from Mr. F. W. Scheidenhelm, "History of the
 enty-Sixth Engineers (Water Supply Regiment) in the World War
 t., 1917-March, 1919"; and from Sr. J. de D. Tejada, Havana, Cuba,
 Spanish-English Dictionary of Sugar House Terms," Havana, 1927.

ADDITIONS AND USE OF THE LIBRARY IN AUGUST, 1927

DURING the month of August, 1927, there were received at the Library
 23,195 volumes and 12,592 pamphlets. (These include the additions
 both Reference and Circulation Departments.) The number of volumes
 ed for home use was 685,271. Readers and visitors at the Central Build-
 numbered about 268,000.

NEW PERIODICALS

Alpha Kappa Psi diary. Indianapolis, Ind.
Five times yearly.

Published by the Alpha Kappa Psi Fraternity.

American Bankers' Association. — Agricultural Commission. Bulletin. Madison, Wis. Monthly.

Annalen der Betriebswirtschaft. Leipzig. Quarterly.

Annales de l'enfance. Paris. 10 times yearly.

Banco de Colombia. Informe de la junta directiva á la asamblea general. Bogota, Colombia. Semi-annual.

Bankers' service bulletin. Chicago, Ill. Monthly.

Bibliotheekgids. Antwerp, Belgium. Quarterly.

Published by the Vlaamsche Vereeniging van Bibliotheecarissen en Bibliotheekbeamten.

Canadian unionist. Ottawa. Monthly.

Carinthia (province), Austria. — Landtag. (Stenographische Protokolle des Kaertner Landtages.) Klagenfurt, Carinthia, Austria. Irregular.

Charcas. Buenos Aires, Argentina. Monthly.

Chile. — Dirección de los Servicios Agrícolas. Boletín. Santiago de Chile. Irregular.

Circulation. New York. Irregular.

Construction and industry. Tel-Aviv, Palestine. Monthly.

Published by the Association of Engineers and Architects in Palestine.

Honduras. — Dirección General de Sanidad. Boletín sanitario. Tegucigalpa, Honduras. Quarterly.

Idaho engineer. Moscow, Idaho. Semi-annual.

Published by the Associated Engineers of Idaho University.

L'Igiene moderna. Genova, Italy. Monthly.

Published by the Istituto d'igiene delle Reale Università di Genova.

Industria mineraria. Roma. Monthly.

Published by the Federazione nazionale fascista dell'industria mineraria.

Industrial bulletin. Trenton, N. J. Monthly.

Published by the New Jersey Labor Department.

Industrial Workers of the World. — General Defense Committee. Bulletin. Chicago, Ill. Irregular.

Institution of Engineers, Australia. Quarterly bulletin. Sydney, N. S. W. Quarterly.

Internationale Revue i10. Huisterheide, Holland. Monthly.

Mexico. — Departamento de Minas. Boletín de industrias minerales. México, D. F. Monthly.

México. Barcelona, Spain. Monthly.

Published by the Consulado general de México en Barcelona.

Mondolinguo Weltsprache. Dessau, Germany. Bi-monthly.

Organ of the Deutscher Ido-Bund.

Monitor. Buffalo, N. Y. Monthly.

Published by the Associated Industries of New York.

Motion picture record. Seattle, Washington. Weekly.

National Arts Club. Bulletin. New York. Monthly.

National Better Business Bureau. — Financial Department. Bulletin. New York. Irregular.

National Better Business Bureau. — Merchandise Department. Bulletin. New York. Irregular.

National Security League. Quarterly. New York. Quarterly.

Neue Bücherschau. Berlin-Charlottenburg, Germany. Bi-monthly.

Nueva generación. Santiago, Chile. Semi-monthly.

Published by the Asociación de estudiantes contra el alcoholismo.

New culture. Portland, Ore. Monthly.

Published by the Ancient Order of the En Soph.

Norman Hapgood's Weekly letter. New York. Weekly.

Orient im Bild. Potsdam, Germany. Monthly.

Revue normande. Paris. Bi-monthly.

Rote Lebensmittelarbeiter. Berlin. Semi-monthly.

Published by the Internationaler Propaganda-Komitee der Nahrungs- und Genussmittelarbeiter.

- bath bulletin.** New York. Irregular.
Published by the Jewish Sabbath Alliance of America, Inc.
- ony.** Ministerialblatt für die sächsische innere Verwaltung. Dresden, Germany. Semi-monthly.
- ony.** — Landesamt für Arbeitsvermittlung. Die Arbeitsmarkt in Sachsen. Dresden, Germany. Weekly.
- ony.** — Landesversicherungsanstalt. Die invaliden- und Hinterbliebenenversicherung in Sachsen. Dresden, Germany. Irregular.
- ony.** — Landeswohlfahrts- und Jugendamt. Blätter für Wohlfahrtspflege. Dresden, Germany. Monthly.
- ony.** — Landtag. Verhandlungen des sächsischen Landtages. Dresden, Germany. Irregular.
- ony.** — Ministerium der Justiz. Justizministerialblatt. Dresden, Germany. Irregular.
- ony.** — Ministerium für Volksbildung. Verordnungsblatt. Dresden, Germany. Semi-monthly.
- ony.** — Staatskanzlei. Gemeinsames Ministerialblatt. Dresden, Germany. Semi-monthly.
- Scene.** Berlin. Monthly.
Published by Vereinigung künstlerischer Bühnenvorstände F. V.
- enectady Union-Star.** Schenectady, N. Y. Daily.
- pps Institution of Oceanography.** Technical series. Bulletin. La Jolla, Cal. Irregular.
- aloa (state), Mexico.** — Cámara de Diputados. Diario de los Diputados. Culiacán, Sinaloa. Daily.
- thern architect and building news.** Atlanta, Ga. Monthly.
- thern builder.** New Orleans, La. Monthly.
Published by the Southern Builders Supply Association.
- thern furniture journal.** High Point, N. C. Monthly.
- thern Israelite.** Augusta, Ga. Semi-monthly.
- itzerland.** — Gesundheitsamt. Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene. Bern, Switzerland. Bi-monthly.
- Takai.** Tarbut, Kaunas, Lithuania. Irregular.
- Technical outlook.** New York. Monthly.
Published by the Union of Technical Engineers, Architects, Draftsmen and Chemists, Local 13.
- Tobacco planter.** Louisville, Ky. Monthly.
Published by the Dark Tobacco Growers' Co-operative Association.
- Type craft.** New York. Monthly.
Published by the Machine Composition Association.
- Tzentral'naya Yevropa.** Prague, Czechoslovakia. Weekly.
- United farmer.** Bismarck, N. D. Monthly.
Published by the United Farmers' Educational League.
- United States.** — Weather Bureau. Weather and crop bulletin. Washington, D. C. Weekly.
- Universidad nacional del Litoral.** — Facultad de Ciencias Económicas, Comerciales y Políticas. Revista. Rosario de Santa Fé, Argentina. Irregular.
- Usecop.** México, D. F. Semi-monthly.
Organ of the Unión sindical de empleados de comercio y oficinas particulares.
- Victorian Order of Nurses for Canada.** News letter. Ottawa, Canada. Semi-annual.
- Washington (state).** — Western Washington Experiment Station. Popular bulletin. Puyallup, Wash. Quarterly.
- West Virginia Collegiate Institute.** Bulletin. Institute, West Va. Quarterly.
- Westchester county fair.** New York. Monthly.
- White Russia.** — Instytut belaruskaye kultury. Addzel 4, ser. 1. Mensk, White Russia.
— Addzel 5, ser. 5. Mensk, White Russia. Irregular.
- Wings.** New York. Monthly.
Published by the Literary Guild of America.
- Wireless trader.** London. Weekly.
- Wirtschaftshefte der Frankfurter Zeitung.** Frankfurt, Germany. Irregular.
- Women's Trade Union League.** Monthly bulletin. New York. Monthly.
- Yucatan.** Diario oficial. Merida, Yucatan. Daily.
- Zeitschrift für Deutschkunde.** Leipzig, Germany. Monthly.
- Zeitschrift für Völkerrecht.** Breslau, Germany. Quarterly.

STARCHES

1811-1925

A LIST OF REFERENCES DEALING WITH THE CHEMISTRY AND TECHNOLOGY OF STARCHES, DEXTRINS AND AMYLASES

COMPILED BY

ROBERT P. WALTON, Science and Technology Division

ORDER OF ARRANGEMENT

STARCHES AND DEXTRINS

CHEMICAL SECTION

- Acid Hydrolysis
- Enzymic Hydrolysis
- Molecular Constitution
- Components of Starch Granule
- Crystalline Dextrins formed by Bacterial Degradation of Starch
- General Chemical Characteristics
 - Reactions with Iodine
 - Reactions with Formaldehyde
 - Reactions with Bases
 - Reactions with Oxidizing Agents
- Ethers and Esters
- Hydrolysis by Salts
- Soluble and Modified Starches
- Preservation of Starch Solutions

PHYSICAL SECTION

- General Physical Characteristics
 - Viscosity and Plasticity
 - Gelatinization
 - Coagulation and Retrogradation
- Microscopic Observations

ANALYTICAL SECTION

- Methods of Determination
 - Polarimetric Methods
 - Saccharimetric Methods

ANALYTICAL SECTION, *continued.*

- Gravimetric Methods
- Iodine Methods
- Specific Gravity Methods
- Comparison of Methods
- Detection, Differentiation and Identification
- Determinations in Various Materials
- Analytical Examination

TECHNOLOGICAL SECTION

- Industrial Sources
- Manufacture of Starch
- Manufacture and Preparation of Dextrin
- Starch Factory Waste Waters
- Industrial Applications of Starch and Dextrin

AMYLASES

- Purification
- General Characteristics
- Activation and Inactivation by Salts, Acids, etc.
- Optimum and Inactivating Temperatures
- Action of Sunlight, Ultra-Violet Rays and Roentgen Rays
- Adsorption of Amylases
- Determination of Activity
 - Determination of Amylolytic Activity
 - Determination of Saccharogenic Activity
- Mould, Fungus, Yeast and Bacterial Amylases
- Sources and Occurrence
- Industrial Applications

PART VIII

AMYLASES, *concluded*

ACTION OF SUNLIGHT, ULTRA-VIOLET RAYS AND ROENTGEN RAYS

3069. **Fermi**, Claudio, and **LEONI PERNOSSI**. Über die Enzyme. Vergleichende Studien. (Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Jena, 1894, Bd. 15, p. 229-234.) **QDA**

Note that dried amylase may be exposed to sunlight for 2 months without appreciable variation in its activity; also, note that hydrogen sulphide does not affect amylase.

Abstract in *Chem. Centr.*, 1894, Bd. 1, p. 965.

3070. **Green**, J. R. The influence of light on diastase. (Annals of botany, London, 1894, v. 8, p. 370-373.) **QEA**

Amylase is destroyed by sunlight and by

the light of an electric arc. The violet rays of the spectrum are most destructive, whereas the less refrangible waves show a slightly favorable influence.

Abstract in *Chem. Centr.*, 1895, Bd. 2, p. 571; *Jour. chem. soc.*, 1896, v. 70, part 1, p. 110.

3071. — Action of light on diastase and its biological significance. (Abstract.) (Royal Society, Proceedings, London, 1897, v. 61, p. 25-28.) ***EC**

Finds exposure to whole of the spectrum caused a marked destruction of amylase. Infra-red, red, orange, and blue give increases of amylolytic activity, while violet and green cause an appreciable diminution.

ases, continued.

on of Sunlight, Ultra-Violet Rays and
Roentgen Rays, continued.

screening influence of the proteids was
stigated.

bstract in *Jour. soc. chem. ind.*, 1897, v. 26, p.

2. **Emmerling, O.** Die Einwirkung des
nenlichtes auf die Enzyme. (Deutsche
mische Gesellschaft, Berichte, Berlin,
Jahrg. 34, p. 3811-3814.) **PKA**

amylase is included among enzymes in-
gated. Concludes that, in general, sun-
t has little effect on enzymes.

bstract in *Jour. chem. soc.*, 1902, v. 82, part 1,
5; *Chem. Centr.*, 1902, Bd. 1, p. 128; *Bull. soc.*
Paris, 1898, série 3, tome 28, p. 177.

3. **Bode, G.** Die Einwirkung des
htes auf keimende Gerste und Grünmalz.
ochenschrift für Brauerei, Berlin, 1905,
g. 22, p. 785-786.) **†VTRA**

otes that amylase is destroyed by the
on of light.

bstract in *Chem. Centr.*, 1906, Bd. 1, p. 509.

4. **Loewenthal, S.**, and **J. Wohlgemuth.**
ersuchungen über die Diastasen. 8.
r den Einfluss der Radiumemanation
die Wirkung des diastatischen Fer-
tes. (Biochemische Zeitschrift, Berlin,
9, Bd. 21, p. 476-483.) **PPB**

xperiments with various animal amy-
s show in general an increase of amylo-
tic activity.

bstract in *Bull. soc. chim. France*, 1910, série 4,
8, p. 1046.

5. **Agulhon, H.** Action des rayons ul-
violet sur les diastases. (Académie des
nces, Comptes rendus, Paris, 1911, tome
p. 398-401.) ***EO**

otes that the action of ultra-violet rays
ces the activity of pancreatic and malt
lase.

bstract in *Jour. soc. chem. ind.*, 1911, v. 30, p.
Jour. chem. soc., 1911, v. 100, part 2, p. 243;
m. Zentr., 1911, Bd. 1, p. 1070; *Bull. assoc.*
istes, 1910-11, tome 28, p. 808.

5. **Chauchard, A.**, and **B. Mazoué.** Ac-
des rayons ultra-violet sur l'amylase,
vertine et le mélange de ces deux dia-
ses. (Académie des sciences, Comptes
us, Paris, 1911, tome 152, p. 1709-1711.) ***EO**

he weakening effect of ultra-violet rays
n both amylase and invertin is extremely
d at the beginning but gradually be-
es less. In a mixture of these enzymes
amylase, because of its greater sensi-
ness to the rays, is weakened much

more rapidly than the invertin.—*Chem.*
abst.

Abstract in *Chem. Zentr.*, 1911, Bd. 2, p. 341;
Bull. soc. chim. France, 1912, série 4, tome 11, p. 48.

3077. **Delezenne, C.**, and **M. Lisbonné.**
Action des rayons ultraviolets sur le suc
pancréatique. Leur influence sur l'activa-
tion du suc par la kinase et par les sels de
calcium. (Académie des sciences, Comptes
rendus, Paris, 1912, tome 155, p. 788-790.)
***EO**

Note that amylase is more resistant to
the action of ultra-violet rays than lipase or
trypsinogen.

3078. **Chauchard, A.** Étude quantitative de
l'action des rayons ultra-violet monochro-
matiques sur l'amylase. (Académie des sci-
ences, Comptes rendus, Paris, 1913, tome
156, p. 1858-1860.) ***EO**

The photochemical action is proportional
to the absorption of these rays by the solu-
tion containing the enzyme. The amount
of ray-energy capable of raising the tem-
perature of the solution only 0.25° decom-
poses 0.4 of the amylase.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1913, Bd. 2, p. 589.

3079. **Chauchard, A.**, and **A. Chauchard.**
Action des rayons ultraviolets monochro-
matiques sur l'amylase de la lipase du suc
pancréatique. (Académie des sciences,
Comptes rendus, Paris, 1914, tome 158, p.
1575-1577.) ***EO**

Abstract in *Chem. abst.*, 1914, v. 8, p. 3061;
Chem. Zentr., 1914, Bd. 2, p. 721; *Bull. soc. chim.*
France, 1915, série 4, tome 17, p. 120.

3080. **Richards, A.** The effect of X-rays on
the action of certain enzymes. (American
journal of physiology, Baltimore, 1914, v.
35, p. 224-238.) **QEA**

Notes that short radiation with X-rays
accelerates the saccharogenic activity of
amylase, whereas activity is inhibited by
longer radiation.

3081. **Laborde, and Lemay.** Action des sub-
stances radioactives sur l'amylase. (Société
de biologie, Comptes rendus, Paris, 1921,
tome 85, p. 497-498.) **QAA**

Solutions of radioactive substances, Ra,
meso-Th, and Th bromides are without in-
fluence on the action of amylase.—*Chem.*
abst.

Abstract in *Chem. Zentr.*, 1922, Bd. 1, p. 50.

3082. **Pincussen, Ludwig.** Fermente und
Licht. 1. Diastase 1. (Biochemische Zeit-
schrift, Berlin, 1922, Bd. 134, p. 459-469.)
PPB

The activity of malt amylase, as meas-
ured by disappearance of the I reaction, is

*Amylases, continued.**Action of Sunlight, Ultra-Violet Rays and Roentgen Rays, continued.*

completely destroyed by exposure to ultra-violet rays; the destruction is greatest at pH 4.6. Determines effect of salts, sugars and temperature variations on destruction by ultra-violet light and by sunlight.

Abstract in *Chimie et industrie*, 1923, v. 10, p. 858.

3083. Aversenq, J. P., and others. Sur quelques actions du thorium X sur les diastases et les microbes. Par J. P. Aversenq, L. Jaloustre et E. Maurin. (Académie des sciences, Comptes rendus, Paris, 1923, tome 176, p. 193-195.) *EO

Note that thorium X increases the saccharogenic action of salivary, malt and pancreatic amylases.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1649; *Chem. Zentr.*, 1923, Bd. 3, p. 633; *Chimie et industrie*, 1923, v. 10, p. 251.

3084. Baly, E. C. C., and ELIZABETH S. SEMMENS. Selective photochemical action of polarized light. 1. The hydrolysis of starch. (Royal Society of London, Proceedings, 1924, v. 97B, p. 250-253.) *EC

Numerous experiments on potato, wheat, and maize starch demonstrated that plane-polarized light exerts a powerful acceleration on the hydrolysis of starch by amylase, but does not influence its hydrolysis by acids.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1925, Bd. 1, p. 1331.

3085. Peskov, N. P. Chemical reactions under the influence of X-rays. (Abstract.) (Chemical abstracts, Easton, 1924, v. 18, p. 1083.) PKA

The inhibition of amylolytic hydrolysis by X-rays is increased 20 times by adding an insoluble Ba salt to the amylase solution. This effect is due to a generation of radiation through the entire mass of the reacting medium.

3086. Pincussen, Ludwig, and FRANCESCO DI RENZO. Fermente und Licht. 4. Diastase 3. (Biochemische Zeitschrift, Berlin, 1924, Bd. 144, p. 366-371.) PPB

One per cent starch solutions were less affected by light from a Hg quartz lamp

than more dilute (0.25%) solutions; those containing large amounts of enzyme (0.2%) were less affected than those with 0.1% diastase. The general agreement between inactivation constants calculated from a series of experiments in which relatively small amounts of diastase were used with relatively large amounts of starch showed that under these conditions inactivation by light was a monomolecular reaction.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1924, Bd. 1, p. 2158.

3087. Pincussen, Ludwig. Fermente und Licht. 5. Diastase. 5. (Biochemische Zeitschrift, Berlin, 1924, Bd. 144, p. 372-378.) PPB

Using malt and pancreatic amylases, studies the protective action of various salts and buffer mixtures against destruction by sunlight and by light from a mercury quartz lamp. Ammonium, sodium and potassium salts, and phosphate and acetate buffers are used. The salts in general exert a protective influence; in some cases the protective action is more marked in dilute solutions than in concentrated solutions.

Abstract in *Chem. abst.*, 1924, v. 18, p. 3068; *Jour. chem. soc.*, 1924, v. 126, part 1, p. 469; *Chem. Zentr.*, 1924, Bd. 1, p. 2158.

3088. — Fermente und Licht. 6. Über Beeinflussung von Fermentwirkungen durch Jodsalze unter Bestrahlung. (Biochemische Zeitschrift, Berlin, 1924, Bd. 152, p. 406-415.) PPB

The activity of malt amylase, pancreatic amylase, saliva and taka diastase was found to be less after these enzymes were exposed to the light of a Hg-quartz lamp. With the exception of malt amylase the addition of KI served to protect the enzyme somewhat from the action of the light.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1925, Bd. 1, p. 675.

3089. — Über den Einfluss der Reinigung von Fermenten auf ihre Empfindlichkeit gegenüber der Strahlung. (Fermentforschung, Berlin, 1925, Jahrg. 8, p. 181-186.) PPH

Abstract in *Chem. abst.*, 1925, v. 19, p. 2503.

ADSORPTION OF AMYLASES

3090. Cazeneuve, P. Observations critiques sur l'emploi des filtres de plâtre pour stériliser les liquides à ferments. (Société chimique de Paris, Bulletin, 1884, nouv. série, tome 42, semestre 2, p. 89-94.) PKA

Notes that a solution of barley diastase exhibits no amylolytic activity after passage through a filter of plaster.

3091. Levy, David J. Some physical properties of ptyalin. (Michigan Academy of Science, Reports, Lansing, 1904, no. 6, p. 155-161.) *EA

Notes that repeated filtration destroys the saccharogenic activity of saliva.

Abstract in *Bull. assoc. chimistes*, 1904-05, tome 22, p. 1346.

ases, continued.

ption of Amylases, continued.

Michaelis, Leonor, and M. EHREN-
Die Adsorptionsanalyse der Fer-
e. (Biochemische Zeitschrift, Berlin,
Bd. 10, p. 283-299.) **PPB**

sorption of malt and saliva amylase by
n non-specific substrata show both to
nphotic.

tract in *Jour. soc. chem. ind.*, 1908, v. 27, p.
chem. abst., 1909, v. 3, p. 920; *Jour. chem. soc.*,
v. 94, part 1, p. 587; *Chem. Zentr.*, 1908, Bd.
3.

Peters, Amos W. Studies on en-
s: 1. The adsorption of diastase and
se by colloidal protein and by normal
phosphate. (Journal of biological
istry, Baltimore, 1908-09, v. 5, p. 367-
PPB

attempt to purify by adsorption amy-
of various origins. Finds activity is
erated by the presence of lead phos-

tract in *Jour. soc. chem. ind.*, 1909, v. 28, p.
Jour. chem. soc., 1909, v. 96, part 1, p. 124;
Zentr., 1909, Bd. 1, p. 558.

Holderer, M. Influence de la ré-
n du milieu sur la filtration de quelques
ases du malt. (Académie des sciences,
otes rendus, Paris, 1910, tome 150, p.
87.) ***EO**

ing a porcelain filter, determines in-
ce of medium on filtration of amylase
dextrinase. The activity of the en-
s was determined, respectively, by vis-
y measurements and by determining
nt of sugars formed in presence of
solutions. In both cases activity is
ected in a medium neutral to phenol-
alein but is diminished in a medium
al to methyl orange.

tract in *Chem. Zentr.*, 1910, Bd. 1, p. 1151.

Michaelis, Leonor, and P. RONA. Die
nflussung der Adsorption durch die Re-
n des Mediums. (Biochemische Zeit-
ft, Berlin, 1910, Bd. 25, p. 359-366.) **PPB**

th kaolin and charcoal, dialyzed plant
ase shows a minimum adsorption in
ly alkaline medium.

Holderer, M. Mécanisme de l'arrêt
diastases par filtration. (Académie des
ces, Comptes rendus, Paris, 1912, tome
p. 318-319.) ***EO**

ylases are usually inactivated by fil-
n through a Chamberlain filter. No
vation, however, is observed in an
ne medium or in a medium containing
peptone or egg white.

tract in *Chem. abst.*, 1913, v. 7, p. 615.

3097. Welker, William H., and JOHN MARSHALL. The precipitation of enzymes from their solution by moist aluminium hydroxide. (American Chemical Society, Journal, Easton, 1913, v. 35, p. 822.) **PKA**

All the enzymes studied, with the excep-
tion of amylase, were quantitatively re-
moved from solution by aluminium hy-
droxide. After addition of aluminium hy-
droxide to saliva, the filtrate exhibited
marked amylolytic activity but very slight
saccharogenic activity.

3098. Rakuzin, M. A., and G. D. FLIER.
Optical properties of diastase and its ad-
sorption by kaolin and by aluminium hy-
droxide. [Title translated.] (Russian Physical
Chemistry Society, Journal, St. Peters-
burg, 1916, tome 48, p. 321-324.) **PKA**

Merck's diastase is 84% soluble at 60°,
the solution being optically inactive. The
concentration of diastase is lowered 7% by
a process of irreversible adsorption on
aluminium hydroxide. Diastase is not ad-
sorbed by the electro-negative kaolin.

Abstract in *Chem. abst.*, 1917, v. 11, p. 454; *Jour.
chem. soc.*, 1917, v. 36, p. 300; *Bull. soc. chim.
France*, 1918, série 4, tome 24, p. 8.

3099. Rakuzin, M. A. Protein "bodies" and
"antibodies" as adsorption products. [Title
translated.] (Russian Physical Chemistry
Society, Journal, Petrograd, 1916, tome 48,
p. 465-468.) **PKA**

Notes that amylase is divided into two
fractions by adsorption on $Al(OH)_3$. The
fraction which is adsorbed does not give
Ostromlevsky's reaction whereas the frac-
tion which is not adsorbed does give the
reaction.

3100. Ambard, L. Sur l'amylase. Son do-
sage. Mécanisme de la digestion amylo-
lytique. (Société de chimie biologique, Bulle-
tin, Paris, 1921, tome 3, p. 51-65.)

Available in Library of the New York
Academy of Medicine.

Amylase is almost quantitatively re-
moved from solution by powdered starch.
The enzyme remains fixed during repeated
washing but is readily given up to filtered
starch solutions containing neutral salts.
Details a method for determination of sac-
charogenic activity based on this fact. Be-
lieves that the enzyme action is preceded by
the formation of a starch-amylase complex,
the presence of electrolytes being necessary
for this combination.

Advance report in *Comptes rendus de Société de
biologie*, 1920, tome 83, p. 1458-1460; tome 84, p.
230-232, *QAA*.

Abstract in *Chem. abst.*, 1921, v. 15, p. 2651;
Chem. Zentr., 1921, Bd. 1, p. 299, 1022; *Bull. soc.
chim. France*, 1921, série 4, tome 30, p. 827.

Amylases, continued.

Adsorption of Amylases, continued.

3101. Effront, Jean. Influence de la filtration sur les amylases. (Société de biologie, Comptes rendus, Paris, 1922, tome 86, p. 271-273.) **QAA**

Ptyalin retained from saliva by filter-paper cannot be removed by water or by sugar solution. It is removable, however, in the presence of NaCl or starch paste. This adsorption increases with rise of temperature and affects not only diastases but also inhibitory substances accompanying them. Diastases may thus be purified by filtration. Many inactive plant juices may be activated by filtration. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1922, Bd. 3, p. 177.

3102. Ambard, L. De l'amylase. Liaison du ferment et des substances qu'il digère. (Société de chimie biologique, Bulletin, Paris, 1923, tome 5, p. 693-716.)

Available in Library of the New York Academy of Medicine.

Finds that glycogen, dextrin and the amyloses remove amylase from the starch amylase complex; the action of the amyloses, however, is comparatively slight. The calculated molecular weight of dextrin from these observations is 3240 as compared with 8000 for glycogen. Amylase and dextrinase are identical in saliva. Salts seemingly accelerate enzyme hydrolysis by making possible a combination of enzyme and substrate. The N content of saliva is not decreased by removing amylase.

Abstract in *Chem. abst.*, 1924, v. 18, p. 992; *Chem. Zentr.*, 1924, Bd. 2, p. 478.

3103. Willstaetter, Richard, and others. Über Pankreas-Amylase. 3. Von R. Willstätter, Ernst Waldschmidt-Leitz und Albert R. F. Hesse. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Berlin and Leipzig, 1923, Bd. 126, p. 143-168.) **PKA**

The glycerol extract of pancreas was freed from lipase by adsorbing the latter with $\text{Al}(\text{OH})_3$. Trypsin was removed from the lipase-free solution by adsorption with kaolin in AcOH solution. Further purification of the amylase by adsorption of the amylase in 50% alcohol with $\text{Al}(\text{OH})_3$ and elution of the enzyme with $(\text{NH}_4)_2\text{HPO}_4$ in NH_4OH gave a preparation 10 times as active as any heretofore described. It is free from protein but gives Molisch's reaction. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1923, Bd. 3, p. 77-79.

3104. Chodat, Fernand, and MELITON PHILIA. Contribution à l'étude du phénomène d'Ambard (fixation de l'amylase par

l'amidon). (Archives des sciences physiques et naturelles, Genève, 1924, période 5, v. 6, p. 118-122.) **PA**

The statement of Ambard, that starch grains will completely "fix" the amylase from a solution, is inaccurate. A variable but appreciable quantity of the enzyme remains in solution. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1924, Bd. 2, p. 2850.

3105. Effront, Jean. Sur le pouvoir adsorbant des pulpes végétales. (Académie des sciences, Comptes rendus, Paris, 1924, tome 178, p. 2032-2035.) ***EQ**

Notes that the ease with which amylase is absorbed depends on the colloidal nature of the solution. If heated first to 40° the amylase is more easily absorbed.

3106. Kraut, Heinrich, and ERWIN WENZEL. Über Enzymadsorption. 1. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's Berlin and Leipzig, 1924, Bd. 133, p. 1-21.) **PKA**

A study of the adsorption of sucrase from autolyzed yeast and of amylase from pancreas extract by $\text{Al}(\text{OH})_3$, with curves showing equilibrium between adsorbed and unadsorbed enzyme under different conditions of concentration and purity of enzyme and amount of adsorbent. — *Chem. abst.*

3106A. Ambard, L. Sur les lois des réactions monomoléculaires (réactions fermentaires — réactions catalytiques). (Journal de chimie physique, Paris, 1925, tome 22, p. 402-412.) **PKA**

The role of adsorption in catalysis was demonstrated by a defixation experiment. Rice starch which has acquired a high amolytic power by centrifuging with NaCl-saliva was treated with glycogen solutions of different concentrations. The amylase was detached from the starch by the glycogen in proportion to the concentration of the latter; the defixation curve presenting all features of an adsorption curve.

Abstract in *Chem. abst.*, 1926, v. 20, p. 608.

3107. Lüers, Heinrich, and ERICH SELLENER. Beiträge zur Reinigung der Malzamyase. (Wochenschrift für Brauerei, Berlin, 1925, Jahrg. 42, p. 97-99, 103-105, 110-112.)

Available in Library of the Department of Agriculture.

Use the adsorption method.

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 402; *Chem. abst.*, 1925, v. 19, p. 2997.

3108. Pringsheim, Hans, and others. Über die Trennung der Fermente des Gerstenmalzes. Von Hans Pringsheim, Alexander Genin und Rahel Perewosky. (Biochem.

ases, continued.

ption of Amylases, continued.

Zeitschrift, Berlin, 1925, Bd. 164, p. 125.)

PPB

Sabalitschka, Th., and C. SCHULZE. Die Malzamyase. 3. Einfluss von Adrenalin auf die dextrinierende und verdauende Wirkung der Amylase. (Fortschritte der Pharmakologie und Toxikologie, Berlin and Wien, 1925, H. 8, p. 449-463.)

PPH

Treatment of amylase solution with various adsorbents, viz., linden charcoal, kieselguhr, animal charcoal, sponge charcoal, china and kaolin showed no difference in

effect on the dextrinizing and saccharifying action. Regardless of the amount of enzyme removed by adsorption, the two curves ran parallel in every case. The evidence supports the view that dextrinizing and saccharifying action are not functions of two separate enzymes. — *Chem. abst.*

3110. Willstaetter, Richard, and others. Über das Adsorptionsverhalten der Pankreasamyase. Von Richard Willstätter, E. Waldschmidt-Leitz und A. R. F. Hesse. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Berlin and Leipzig, 1925, Bd. 142, p. 14-34.)

PKA

Abstract in *Chem. abst.*, 1925, v. 19, p. 1711; *Chem. Zentr.*, 1925, Bd. 1, p. 1744.

DETERMINATION OF ACTIVITY OF AMYLASES

Jungk, J. F. On the rapid determination of the value of extract of malt. (American journal of pharmacy, Philadelphia, 1906, v. 55, p. 289-298.)

Available in Library of the New York Academy of Medicine.

Describes an iodine method for determination of amylolytic activity.

Abstract in *Jahresber. Chem.*, 1884, p. 1799.

2. Bungener, H., and L. FRIES. Über die diastatische Vermögen der Gerste. (Zeitschrift für das gesamte Brauwesen, München and Leipzig, 1886, Jahrg. 9, p. 262-263.)

Available in Library of the Chemists' Club.

Abstract in *Wag. Jahr.*, 1886, Jahrg. 32, p. 753-

3. Cripps, R. A. The determination of diastatic power of extract of malt. (Pharmaceutical journal and transactions, London, 1889-90, v. 49, p. 481.)

WTA

Uses iodine reaction.

Abstract in *Zeit. anal. Chem.*, 1890, Jahrg. 29, p.

4. Helbing, H., and F. W. PASSMORE. Maltzextrakt und seine Bestandteile. (Pharmaceutische Zeitung, Berlin, 1892, Jahrg. 11, p. 809.)

Available in Library of Columbia College Pharmacy.

Diastase is determined by digesting a portion of the extract with 1% arrowroot starch solution, at 40-42°, and estimating conversion of starch by the iodine reaction. Seven extracts are investigated.

Abstract in *Chem. Centr.*, 1893, Bd. 1, p. 399.

5. Dott, D. B. The determination of diastatic action on starch. (Pharmaceu-

tical journal and transactions, London, 1893-94, v. 53, p. 213-214.)

WTA

Uses the iodine reaction.

Abstract in *Chem. Centr.*, 1893, Bd. 2, p. 825.

3116. Terrat, P. Considérations sur l'essai de la diastase de l'orge. (Journal de pharmacie et de chimie, Paris, série 6, tome 6, 1897, p. 494-498.)

Available in Library of Columbia University.

Traces of alkalinity in the water used have a marked influence on the results obtained by the official method of diastase determination. The alkali only affects the second stage of hydration, the conversion of dextrin to maltose.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 277; *Chem. Centr.*, 1898, Bd. 1, p. 267.

3117. Takamine, Jokichi. Simple quantitative determination of diastatic power. (Society of Chemical Industry, Journal, London, 1898, v. 17, p. 437-438.)

VOA

Prepares a standardized sample of taka-diastase. Determines relative amounts of the standard sample and the sample under test which are required to effect the same conversion in the same time as judged by the iodine reaction.

Abstract in *Jour. chem. soc.*, 1898, v. 74, part 2, p. 492; *Chem. Centr.*, 1898, Bd. 2, p. 51.

3118. Friedenthal, Hans. Über eine neue Methode zur Bestimmung der Wirksamkeit von Fermentlösungen. (Central Blatt für Physiologie, Leipzig und Wien, 1899, Bd. 13, p. 481-485.)

Available in Library of the New York Academy of Medicine.

The change in molecular weight of the substrate is followed by determining the freezing point depression.

Abstract in *Chem. Centr.*, 1900, Bd. 1, p. 242.

*Amylases, continued.**Determination of Activity of Amylases, continued.*

3119. Vernon, H. M. Pancreatic diastase, and its zymogen. (*Journal of physiology*, London, 1902, v. 28, p. 137-155.) **QCA**

The method for determination of amylolytic activity is essentially that used by Roberts.

3120. Duncan, W. Some notes on malt and the activity of diastase. (*Federated Institutes of Brewing, Journal*, London, 1903, v. 9, p. 383-404.) **VTRA**

Reviews work of Ling, Salamon, Brown, and Glendinning.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 958.

3121. Ford, John S., and JOHN M. GUTHRIE. The estimation of diastatic power, with a description of a new method. (*Federated Institutes of Brewing, Journal*, London, 1905, v. 11, p. 206-221.) **VTRA**

The decrease in rotation produced by malt extract in an amylo-dextrin solution is taken as a measure of diastatic power. Present a number of comparative figures of this method and the copper reduction method using soluble starch, the results expressed on Lintner's scale. Give method of preparation of amylo-dextrin and soluble starch, with special precautions against metallic and alkaline impurities.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 556.

3122. Blome, W. H. An examination of commercial diastase. (*Pharmaceutical review*, Milwaukee, 1906, v. 24, p. 260-266.)

Available in Library of Columbia College of Pharmacy.

Abstract in *Chem. Centr.*, 1906, Bd. 2, p. 1450.

3123. Brown, Horace T. Über eine neue Methode der Diastasebestimmung unter sterilen Bedingungen. (Auszug.) (*Chemisches Zentralblatt*, Berlin, 1907, Bd. 2, p. 940.) **PKA**

3124. Johnson, William A. A proposed method for the routine valuation of diastase preparations. (*American Chemical Society, Journal*, Easton, 1908, v. 30, p. 798-805.) **PKA**

Solutions of diastatic preparations in increasing proportions are added to separate flasks containing equal quantities of potato starch paste, the contents digested for 10 minutes at 40° and the point noted at which the color of the iodine reaction is discharged. The results agree with those ob-

tained by determining the amount of sugars formed.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 584; *Chem. abst.*, 1908, v. 2, p. 1854; *Jour. chem. soc.*, 1908, v. 94, part 2, p. 743; *Chem. Zentr.*, 1908, Bd. 2, p. 546.

3125. Auzinger, A. Über Fermente im Honig und den Wert ihres Nachweises für die Honigbeurteilung. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1910, Bd. 19, p. 65-83.) **VTA**

The sample is mixed with 1% starch solution and maintained at 45°. At the end of one hour, a blue iodine reaction indicates the absence of diastase.

Abstract in *Chem. abst.*, 1910, v. 4, p. 1201; *Jour. soc. chem. ind.*, 1910, v. 29, p. 291; *Chem. Zentr.*, 1910, Bd. 1, p. 1809.

3126. Chrzaszcz, Tadeusz, and S. PIEROZEK. Untersuchung über Amylase. 2. Vergleichsstudium der Bestimmungsmethoden der Stärkeverflüssigungskraft der Amylase, sowie Untersuchungen ihres Verhaltens in verschiedenen Temperaturen. (*Zeitschrift für Spiritusindustrie*, Berlin, 1910, Jahrg. 33, p. 66-67, 98-99, 132-133, 136, 145-146.) **†† VTZA**

Compares methods of Effront, Chrzaszcz, Pollak, Lintner and Sollied, and Fernbach and Wolff.

Abstract in *Chem. abst.*, 1911, v. 5, p. 755; *Jour. soc. chem. ind.*, 1910, v. 29, p. 583; *Chem. Zentr.*, 1910, Bd. 1, p. 1535.

3127. Haarst, J. van. Over de diastasebepaling in melk. (*Chemisch weekblad, Amsterdam*, 1910, jaarg. 7, p. 354-355.) **†3 - VOA**

The iodine method of Koning is found inapplicable.

Abstract in *Chem. Zentr.*, 1910, Bd. 1, p. 1852.

3128. Koning, C. J. Over de diastasebepaling in melk. (*Chemisch weekblad, Amsterdam*, 1910, jaarg. 7, p. 377.) **†3 - VOA**

A reply to Van Haarst (*entry 3127*).

3129. — De schijnbare diastase-reactie van water op amyllum. (*Chemisch weekblad, Amsterdam*, 1910, jaarg. 7, p. 484-485.) **†3 - VOA**

A continuation of the polemic.

3130. Bradley, H. C., and E. KELLERSBERGER. Problem of enzyme synthesis. 3. Diastase and starch of plant tissues. (*Journal of biological chemistry*, Baltimore, 1912-13, v. 13, p. 425-430.) **PPB**

Amylase in a number of plants is estimated by noting time required for digestion of a starch solution to the achroodextrin stage.

ylases, continued.

termination of Activity of Amylases, continued.

1. **Deutschland, A.** Die Bestimmung diastatischen Kraft. (Zeitschrift für Spiritusindustrie, Berlin, 1912, Jahrg. 35, p. 553.) **VTZA**

2. **Magerstein, Th.** Diastase estimation fermented mash. (Abstract.) (Chemical Abstracts, Easton, 1912, v. 6, p. 2482.) **PKA**
Digestion is first carried out at 50-55° in order that maltose may be formed to protect the amylase from destruction when heated to 60-65°.

3. **Ellrodt, G.** Bestimmung des Diastasegehaltes der vergorenen Miasche. (Zeitschrift für Spiritusindustrie, Berlin, 1914, Jahrg. 37, p. 239, 245.) **VTZA**

Starch solution is digested with a portion of the mash and the products tested with KI solution.

Abstract in *Chem. abst.*, 1914, v. 8, p. 2218; *Chem. Zentr.*, 1914, Bd. 2, p. 1409.

34. **McGuigan, Hugh, and C. L. v. Hess.** The diastases of the blood. (American Journal of physiology, Baltimore, 1914-15, 36, p. 359-360.) **QCA**

Gives method for quantitative determination of amylase in blood.

35. **Hall, A. J.** Konzentrierte Malzextrakte. (Exzug.) (Chemisches Zentralblatt, Leipzig und Berlin, 1921, Bd. 4, p. 277.) **PKA**

Briefly discusses conditions affecting the activity of amylase and describes methods for determination of activity.

36. **Dodds, E. C.** Variations in the diastatic power of the urine in relation to its action, with a suggested method for the estimation of the diastase content. (British Journal of experimental pathology, London, 1922, v. 3, p. 133-137.)

Available in Library of the New York Academy of Medicine.

By the use of dilute phosphate buffers samples are first adjusted to the point of optimum acidity, this acidity corresponding to pH 6.1.

Abstract in *Chem. abst.*, 1922, v. 16, p. 3099; *Chem. Zentr.*, 1923, Bd. 4, p. 230.

37. **Ducháček, F.** Pouvoir diastasique des malts. (Extrait.) (Chimie et industrie, Paris, 1923, v. 9, p. 781.) **VOA**

The analytical results obtained with archy materials are considerably affected by variations in the amylolytic activity of the malts used.

3138. **Effront, Jean.** Méthode pour la détermination des pouvoirs liquéfiantes de l'amylase. (Société de biologie, Comptes rendus, Paris, 1922, tome 86, p. 269-271.)

QAA

Method is based on the coagulating action of I on starch paste. This method is very rapid and is adapted to the study of bacterial cultures, of saliva and of urine.

Abstract in *Chem. Zentr.*, 1922, Bd. 1, p. 609; *Bull. soc. chim. France*, 1922, série 4, tome 32, p. 1325.

3139. **Fabre, R., and H. PÉNAU.** Recherches sur les ferments amylolytiques. 1. Préparation d'un amidon standard. (Société de chimie biologique, Paris, Bulletin, 1923, tome 5, p. 897-910.)

Available in Library of the New York Academy of Medicine.

The reaction of the water is regarded as a vitally important factor. Recommends that the standard starch should be prepared with water having a pH closely approximating neutrality.

Abstract in *Chem. abst.*, 1924, v. 18, p. 997.

3140. **Lampe, B.** Einige Beobachtungen über den Einfluss der löslichen Stärken verschiedener Herkunft bei der Bestimmung der diastatischen Kraft im Malz nach Windisch und Kolbach. (Wochenschrift für Brauerei, Berlin, 1922, Jahrg. 39, p. 31.)

Available in Library of the Department of Agriculture.

Using the soluble starches of Kahlbaum, Merck, Riedel and Schering, finds considerable variation in the results.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43, p. 145B; *Chem. Zentr.*, 1922, Bd. 2, p. 819; *Chimie et industrie*, 1922, v. 8, p. 1098.

3141. **Matthews, Charles G.** Note on the estimation of diastatic activity. (Institute of Brewing, Journal, London, 1922, v. 28, p. 935-936.) **VTRA**

The activity of a finely ground malt flour is shown to be considerably higher than that of its aqueous extract.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1546.

3142. **Astruc, A., and A. RENAUD.** Nouvelles précisions relatives à la fécule destinée aux essais diastasiques. (Journal de pharmacie et de chimie, Paris, 1923, série 7, tome 27, p. 333-337.)

Available in Library of the New York Academy of Medicine.

State that variously prepared potato starches often give widely varying results with the same pancreatin under the same conditions. New specifications detail character of wash water, size of grains, water

*Amylases, continued.**Determination of Activity of Amylases, continued.*

content and drying temperature of the starch grains.

Abstract in *Chem. abst.*, 1923, v. 17, p. 2125; *Chem. Zentr.*, 1923, Bd. 4, p. 483; *Jour. soc. chem. ind.*, 1923, v. 42, p. 514A.

3143. Gore, H. C. A polarimetric method for the estimation of diastatic power. (Association of Official Agricultural Chemists, Journal, Washington, 1923-24, v. 7, p. 364-367.) **PKA**

Determines relationship of decrease in polarization to increase in cupric reducing power, the polarization being determined before and after mutarotation is destroyed by concentrated NH_3 . Details method for estimating amylolytic activity by observing rate of decrease in polarization.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2352; *Chem. Zentr.*, 1924, Bd. 2, p. 2357.

3144. Munsterman, C. A. Determination of the diastatic power of malt and malt-extract. (Chemist-analyst, Phillipsburg, 1923, no. 39, p. 3-5.) **3-VOA**

Abstract in *Chem. Zentr.*, 1924, Bd. 1, p. 971.

3145. Laer, Henri van. Le pouvoir diastatique. Recherches sur la détermination du pouvoir diastatique des malts. (Le Petit journal du brasseur, Bruxelles, 1923, v. 27, p. 1071.)

Available in Library of the Brewers' Academy.

Finds that filtration of malt extracts does not have any appreciable influence on the analytical results obtained.

Abstract in *Chimie et industrie*, 1925, v. 13, p. 659; *Chem. abst.*, 1925, v. 19, p. 2102.

3146. Cohen, I., and E. C. Dodds. A colorimetric method for the estimation of diastase in body fluids. (British medical journal, London, 1924, v. 1, p. 618-620.)

Available in Library of the New York Academy of Medicine.

A portion of the sample is incubated with dextrin at 37° and pH 6.1 for 30 minutes and the I coloration of the resulting solution compared with that of a standard dextrin solution. A curve is given for converting the results into Wohlgemuth's units.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2535.

3147. Fleury, Paul. La mesure de l'activité d'une préparation diastasique et les lois d'action des diastases. (Journal de phar-

macie et de chimie, Paris, 1924, tome 29, p. 278-284, 325-334.)

Available in Library of Columbia College of Pharmacy.

Abstract in *Chem. abst.*, 1925, v. 19, p. 1435.

3148. Chase, Winn W., and Edwin R. Donaldson. Method for evaluation of diastatic compounds. (Textile colorist, New York, 1925, v. 47, p. 781-782.) **††VLA**

Describe a modification of Wohlgemuth's method.

Abstract in *Chem. abst.*, 1926, v. 20, p. 828.

3148A. Davison, W. C. A viscosimetric method for the quantitative determination of amylase. (Johns Hopkins Hospital, Bulletin, Baltimore, 1925, v. 37, p. 281-282.)

Available in Library of New York Academy of Medicine.

Abstract in *Chem. abst.*, 1926, v. 20, p. 61.

3149. Gore, H. C. Effect of hydrogen-ion concentration on the estimation of diastatic power by the polarimetric method. (American Chemical Society, Journal, Easton, 1925, v. 47, p. 281-283.) **PKA**

The amylase in an infusion of malt was as sensitive to changes in pH as the highly purified amylase used by Sherman, Thomas and Baldwin (entry 2952). The optimum pH range was 4.5 to 5.5. It is shown that for correct results by the polarimetric Lintner method the mixture of soluble starch and diastase infusions must be held within the above range. — *Chem. abst.*

3150. Lorber, Leo. Einfache Mikro-Diastase-Bestimmung in den Körperflüssigkeiten. (Biochemische Zeitschrift, 1925, Bd. 163, p. 480-487.) **PPB**

Abstract in *Chem. abst.*, 1926, v. 20, p. 1825.

3151. Seeligmann. Zur Bestimmung von Diastase in Malzextrakt. (Chemiker-Zeitung, Cöthen, 1925, Jahrg. 49, p. 943.)

††VOA

Abstract in *Chem. abst.*, 1926, v. 20, p. 644.

3152. Syniewski, Wiktor. Source of error in the use of Lintner's starch solution for determination of diastatic power. (Abstract.) (Chemical abstracts, Easton, 1925, v. 19, p. 2502.) **PKA**

When Lintner's starch is used for the determination of amylolytic activity low values for the latter are obtained, as an appreciable quantity of amylase may be present without hydrolysis occurring. The error introduced in this way increases with the age of the starch solution and appears to depend on adsorption of amylase by suspended colloidal particles of reversion products of the starch.

ylases, continued.

termination of Activity of Amylases, continued.

3. Windisch, W., and P. KOLBACH. Über Bestimmung der diastatischen Kraft im

Malz und in Malzextrakten. (Wochenschrift für Brauerei, Berlin, 1925, Jahrg. 42, p. 139-141.)

Available in Library of the Department of Agriculture.

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 1396.

DETERMINATION OF AMYLOCLASTIC ACTIVITY

3A. Roberts, William. On the estimation of the amylolytic and proteolytic activity of pancreatic extracts. (Royal Society London, Proceedings, 1881, v. 32, p. 145-146.)

* EC

Suggests that the term "enzyme" be substituted for "ferment." Diastatic activity is expressed as number of c.c. of a 1% starch solution which is digested to the achromic point by 1 c.c. of enzyme solution acting for 10 minutes at 40°. Studies effect of temperature on pancreatic diastase.

Abstract in *Jour. chem. soc.*, 1881, v. 40, p. 1051-1052.

4. Dymond. Methode zur Bestimmung der Diastase im Malzextract. (Auszug.) Pharmaceutische Zeitung, Bunzlau, 1884, Jahrg. 29, p. 671.)

Available in Library of Columbia College Pharmacy.

Digests a portion of the sample with starch paste and notes time required for appearance of the blue I reaction.

Abstract in *Chem. Centr.*, 1884, p. 903.

5. Davoll, David L. Diastasimetrie. (Auszug.) (Chemisches Central-Blatt, Berlin, 1898, Bd. 2, p. 135.)

PKA

The method, which depends on disappearance of blue iodine reaction, is found to be unreliable due to variations in the ratio dextrin to maltose.

6. Lintner, Carl J., and P. SOLLIED. Zur Bestimmung des Stärkeverflüssigungsvermögens des Malzes. (Zeitschrift für das gesamte Brauwesen, München, 1903, Jahrg. 3, p. 329-330.)

† VTRA

Equal quantities of gelatinized starch are treated with varying amounts of malt extract at 65° for 15 minutes.

Note amount of extract required to effect clarification of the liquid. Develop a scale amylolytic activity.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 152; *Chem. Centr.*, 1903, Bd. 2, p. 152; *Wag. Jahr.*, 1903, Jahrg. 49, p. 367.

7. Mueller, Eduard. Die Stärkekleisterung als ein einfaches Hilfsmittel zum Studium diastatischer Fermentwirkungen.

(Zentralblatt für innere Medizin, 1908, Leipzig, Jahrg. 29, p. 385-389.)

Available in Library of the New York Academy of Medicine.

Activity of various solutions is compared by noting the size of the furrow produced by one drop of the solution when placed upon a starch plate.

Abstract in *Chem. abst.*, 1908, v. 2, p. 2581.

3158. Wohlgemuth, J. Über eine neue Methode zur quantitativen Bestimmung des diastatischen Fermentes. (Biochemische Zeitschrift, Berlin, 1908, Bd. 9, p. 1-9.)

PPB

Various amounts of enzyme solutions are digested with 5 c.c. of 1% soluble starch at 40° for 30 minutes. The amount of enzyme required to effect disappearance of the blue iodine reaction is noted. Results are expressed as number of c.c. of starch solution digested to this stage by 1 c.c. of enzyme solution. Gives plates showing various color shades of the I reaction.

Abstract in *Chem. abst.*, 1908, v. 2, p. 2569; *Bull. assoc. chimistes*, 1908-09, tome 26, p. 516; *Bull. soc. chim. Paris*, 1906, série 4, tome 4, p. 1455.

3159. Hawk, P. B. A modification of Wohlgemuth's method for the quantitative study of the activity of the pancreatic function. (Archives of internal medicine, Chicago, 1911, v. 8, p. 552-556.)

Available in Library of the New York Academy of Medicine.

Recommends the use of phosphate buffers.

Abstract in *Chem. abst.*, 1912, v. 6, p. 237.

3160. Schorokauer, H., and G. G. WILENKO. Zur Bestimmung der Diastase in Organen. (Biochemische Zeitschrift, Berlin, 1911, Bd. 33, p. 275-281.)

PPB

Ten gr. of organ are triturated with 20 gr. of fine sea sand, and the mixture shaken an hour. The liquid is decanted, centrifuged and used for determination of amylase by method of Wohlgemuth. — *Chem. abst.*

3161. Evans, C. L. A criticism of two methods for the determination of amylolytic activity. (Journal of physiology, Cambridge, 1912, v. 44, p. 220-224.)

QCA

The method in which digestion is carried to the achromic point and also the method of Wohlgemuth are criticized.

Amylases, continued.

Determination of Amyloclastic Activity, c't'd.

3162. Wohlgemuth, J. Zur Kenntnis der Takadiastase. (*Biochemische Zeitschrift*, Berlin, 1912, Bd. 39, p. 324-338.) **PPB**

Quantitatively determines amyloclastic activity of taka-diastase.

Abstract in *Chem. Zentr.*, 1912, Bd. 1, p. 1847; *Bull. soc. chim. France*, 1913, série 4, tome 14, p. 154.

3163. Scheermesser. Über enzymatische Energiemessungen. (*Apotheker-Zeitung*, Berlin, 1913, Jahrg. 28, p. 752-754.)

Available in Library of Columbia College of Pharmacy.

The activity of amylase preparations is measured by digesting with wheat starch in the presence of NaCl and thymol and noting amount required to destroy blue iodine coloration. A digestion temperature of 40° is used for animal amylases and of 50° for plant amylases.

Abstract in *Chem. Zentr.*, 1913, Bd. 2, p. 1429.

3164. Stocks, Percy. The quantitative determination of amylase in blood serum and urine as an aid to diagnosis. (*Quarterly journal of medicine*, Oxford, 1915-16, v. 9, p. 216-244.)

Available in Library of the New York Academy of Medicine.

Describes a simplification of Wohlge-muth's method.

Abstract in *Chem. abst.*, 1916, v. 10, p. 2001.

3165. Bodnár, J. Abgeänderte Wohlge-muthsche Methode zur Bestimmung der Aktivität der Amylase bei Gegenwart von Alkaloiden. (*Fermentforschung*, Leipzig, 1916, Bd. 1, p. 347-350.) **PPH**

Alkaloids are removed by extraction with a suitable organic solvent in order to keep them from interfering with the I reaction. Although the activity of amylase from beans is not affected by morphine and strychnine salts, considerable retardation is caused by atropine sulphate.

Abstract in *Chem. abst.*, 1916, v. 10, p. 2099; *Chem. Zentr.*, 1916, Bd. 1, p. 37.

3166. Lange, C. Über Jod-Stärkereaktion und ihre Verwendung für eine colorimetrische Eiweißbestimmung bei Immunitätsprozessen. (*Biochemische Zeitschrift*, Berlin, 1919, Bd. 95, p. 46-84.) **PPB**

Wohlgemuth's method for estimating amylolytic activity is criticized.

The starch-iodine reaction may be influenced by the presence of other substances, and this fact is made the basis of a method for comparing protein content of fluids in immunological studies.

Abstract in *Chem. abst.*, 1920, v. 14, p. 1349; *Chem. Zentr.*, 1919, Bd. 4, p. 349-350.

3167. Waksman, Selman A. A method of testing the amylolytic action of the diastase of *Aspergillus oryzae*. (*American Chemical Society, Journal*, Easton, 1920, v. 42, p. 293-299.)

Available in Library of the Chemists Club.

Method is designed for measuring amylo-clastic activity of enzyme preparations used in desizing. Starch, best stained with neutral red, is made into a 2% paste, a mixture of this paste and the enzyme is kept at 40° and the time required for the opaque solution to become clear is noted. Finds ratio of amyloclastic activity to saccharogenic activity is 4 to 6 times greater for enzymes of *A. oryzae* than for malt preparations.

Abstract in *Jour. chem. soc.*, 1920, v. 118, part 1, p. 339; *Chem. Zentr.*, 1920, Bd. 4, p. 3; *Bull. soc. chim. France*, 1920, série 4, tome 28, p. 426.

3168. Hall, A. J. A viscosity method for testing diastase products. (*Canadian dyer and color user*, Toronto, 1921, v. 1, p. 156, 161.) **† VLA**

Diastase for use in stripping starched fabrics is evaluated by determining the change of viscosity produced in a 3% potato starch solution by the action of a definite quantity of 0.4% solution of diastase at 21-22° for 40 minutes. A very simple apparatus and procedure are described.—*Chem. abst.*

3169. Olsson, Urban. Nachtrag zu der vorausgehenden Mitteilung über "Vergiftungserscheinungen an Amylasen."—Eine Methode zur Messung der Stärke-Verflüssigung. (*Zeitschrift für physiologische Chemie*, Hoppe-Seyler's, Berlin and Leipzig, 1922, Bd. 119, p. 1-3.) **PKA**

Method depends on time required for a glass shot to fall to the bottom of an evacuated tube containing the starch enzyme mixture.

The great difference between time required for solution and for saccharification is taken as evidence favoring the two-enzyme theory of malt amylase.

Abstract in *Chem. abst.*, 1922, v. 16, p. 3495; *ibid.*, 1923, v. 17, p. 1813; *Chem. Zentr.*, 1922, Bd. 3, p. 67.

3170-3171. Adam, A. Diastasebestimmung für klinische Zwecke. (*Klinische Wochenschrift*, Berlin, 1923, Jahrg. 2, p. 1548-1549.)

Available in Library of the New York Academy of Medicine.

A modification of Wohlgemuth's method. Remarks by Wohlgemuth, *ibid.*, p. 2208; reply by Adam, *ibid.*, p. 2208-2209.

Abstract in *Chem. Zentr.*, 1923, Bd. 4, p. 569.

DETERMINATION OF SACCHAROGENIC ACTIVITY

2. **Lintner**, Carl J. Studien über Diastase. (Journal für praktische Chemie, Leipzig, 1886, N. F., Bd. 34, p. 378-394.) **PKA**

For the preparation of large quantities of soluble starch, recommends that the starch covered with a 7.5% solution of HCl for 3 days at ordinary temperature or 3 days at 60° then washed free from acid and dried. Starch thus treated does not form a paste, easily reduces Fehling's solution, is easily soluble in hot water, and its solutions remain clear for several days. In the determination of saccharogenic activity, varying amounts of extract are added to 10 test tubes containing equal amounts of starch solution and after digesting for 1 hour, 5 c.c. of Fehling's solution is added to each tube, the tubes placed in boiling water and the first tube noted in which the copper has been reduced. The diastatic activity is expressed as 100 when 0.1 c.c. of an extract of 5 grams malt with 500 c.c. water reduces 5 c.c. Fehling's solution. Gives method for preparation of diastase by extracting green malt with 20% alcohol. The preparation is purified by successive precipitations with alcohol and by dialysis. Although differing in elementary composition, the purified product gives a number of reactions which indicate a similarity to the albumenoids.

Condensed in *Wag. Jahr.*, 1886, Jahrg. 32, p. 1251.

Abstract in *Jour. soc. chem. ind.*, 1887, v. 6, p. 621; *Jour. chem. soc.*, 1887, v. 52, p. 165-166; *Chem. Centr.*, 1886, p. 923-924.

3. **Morawski**, Th., and **M. Gläser**. Die Wirksamkeit verschiedener Malzarten. Jahres-Bericht über die Leistungen der chemischen Technologie, Wagner's, Leipzig, 1887, Jahrg. 33, p. 1010-1014.) **VOA**
The methods of Kjeldahl and Lintner are used.

4. **Soeldner**, Fr. Über Diastasebestimmungen in Diastase-Malzextrakten. (Pharmazeutische Zeitung, Berlin, 1889, Jahrg. p. 493-494, 501.)

Available in Library of Columbia College Pharmacy.

Describing the method of Lintner, recommends a preliminary determination of the reducing power of the extract.

Abstract in *Chem. Centr.*, 1889, Bd. 2, p. 712.

5. **Ling**, Arthur R. A method for the determination of the diastatic capacity of malt. (Federated Institutes of Brewing, Journal, London, 1896, v. 2, p. 335-346.)

VTRA

Gives resume. Describes new method in which a determination is first carried out

by method of Lintner, those tubes selected in which reduction is almost complete and their contents thereupon titrated with Fehling's solution.

Abstract in *Jour. soc. chem. ind.*, 1896, v. 15, p. 621; *Chem. Centr.*, 1896, Bd. 2, p. 642.

3176. **Sykes**, W. G., and **C. A. Mitchell**. Estimation of diastatic power in malt. (Analyst, London, 1896, v. 21, p. 122-128.) **PKA**

Under definite conditions starch solution is treated with malt extract at 21°, excess Fehling's solution added and the reduced copper determined. Results are expressed on the Lintner scale.

Abstract in *Jour. soc. chem. ind.*, 1896, v. 15, p. 621; *Chem. Centr.*, 1896, Bd. 2, p. 108; *Bull. assoc. chimistes*, 1896-97, tome 14, p. 257.

3177. **Wróblewski**, Augustin. Über die chemische Beschaffenheit der Diastase und über die Bestimmung ihrer Wirksamkeit unter Benutzung von löslicher Stärke, sowie über ein in den Diastasepräparaten vorhandenes Arabin. 1. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Strassburg, 1898, Bd. 24, p. 173-223.) **PKA**

Gives lengthy review. Describes apparatus for dialyzing amylase preparations in a continuous stream of water. A soluble modification of rice starch is prepared by the aid of KOH. Various salts are tested for their ability to precipitate starch. Gives method for determining saccharogenic activity.

Abstract in *Jour. chem. soc.*, 1898, v. 74, part 1, p. 713; *Chem. Centr.*, 1898, Bd. 1, p. 393; *Bull. soc. chim. Paris*, 1898, série 3, tome 20, p. 634.

3178. **Egloffstein**. Eine praktische Methode zur Bestimmung der diastatischen Wirksamkeit. (Zeitschrift für das gesamte Brauwesen, München, 1903, Jahrg. 26, p. 330-334.)

Available in Library of the Brewers' Academy.

A 3% solution of arrowroot starch was digested with the enzyme preparation for 30 minutes at 37.6°, the action arrested by addition of KOH and the maltose estimated by method of Bergsten.

Abstract in *Chem. Centr.*, 1903, Bd. 2, p. 153.

3179. **Pollak**, Alfred. Methode zur Bestimmung diastatischer Wirksamkeit. (Zeitschrift für Spiritusindustrie, Berlin, 1903, N. F., Jahrg. 26, p. 241-243.)

Available in Library of the Patent Office.

By means of a short preliminary test, the diastatic activity of the solution is roughly determined, so that an approximately equal amount of active diastase is

*Amylases, continued.**Determination of Saccharogenic Activity, continued.*

used in all of the actual determinations. The determination proper is effected by heating the diastase with 3% starch paste for 30 minutes at a temperature of 37.6°, adding KOH to stop diastatic action, and titrating with Fehling's solution.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 763.

3180. Harrison, E. F., and D. Gair. The examination of some commercial malt extracts. (*Pharmaceutical journal*, London, 1906, v. 77, p. 94-95.)

Available in Library of the New York Academy of Medicine.

Determine per cent starch completely converted by 0.2 gr. extract acting on 1 gr. of starch at 40° for ½ hour; the maltose formed is estimated by Fehling's solution and the results calculated to starch by the formula given.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 830.

3181. Report of the Malt Analysis Committee to the Council of the Institute of Brewing. (*Institutes of Brewing, Journal*, London, 1906, v. 12, p. 1-10.) **VTRA**

In the method recommended for determination of diastatic activity the malt extract is allowed to act on 2% starch paste at 21° for 1 hour and the resulting mixture titrated against 5 c.c. Fehling's solution.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 236.

3182. Kleemann, Andreas. Untersuchungen über Malzdiastase. (*Landwirtschaftliche Versuchs-Stationen*, Berlin, 1906, Bd. 63, p. 93-134.)

Available in Library of the Department of Agriculture.

Describes 2 methods for determination of amylolytic activity; in the first a 2% starch solution is digested to the achromic point and in the second the sugars formed are determined with Fehling's solution.

Abstract in *Chem. Centr.*, 1906, Bd. 1, p. 62.

3183. Canet, M., and O. Durieux. Application de la méthode de Lintner relative au dosage de l'amidon dans les orges au dosage de l'amidon dans les matières amylacées en général. (*Société chimique de Belgique, Bulletin*, Gand, 1907, année 21, p. 329-333.) **PKA**

Lintner's method gives satisfactory results.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 1208; *Chem. Zentr.*, 1907, Bd. 2, p. 1990.

3184. Jones, G. C. Determination of diastatic power by Lintner's method. (*Institutes of Brewing, Journal*, London, 1908, v. 14, p. 13-32.) **VTRA**

Discussion, p. 32-40.

Has investigated the following in regard to their effect on results obtained by Lintner's method: acidity or alkalinity of the starch, preparation of the starch, relative amount of water used in making the extract and method of filtration.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 240; *Chem. abst.*, 1908, v. 2, p. 1592.

3185. Pariset. Essai de détermination de l'unité du pouvoir amylolytique dans les recherches sur la quantité d'amylase. (*Société de biologie, Comptes rendus*, Paris, 1908, tome 65, p. 593-594.)

Available in Library of the New York Academy of Medicine.

Proposes that the unit of amylolytic activity of a liquid be the ratio between the quantity of sugar in gr. formed by 1 c.c. of the liquid acting upon 50 c.c. of soluble starch for two hours at 39°, and the amount of starch in the 50 c.c. of soluble starch-solution. — *Chem. abst.*

3186. Wirth, Chr., and Carl J. Lintner. Über die Bestimmung der diastatischen Kraft des Malzes und von Malzextrakten. (*Zeitschrift für das gesamte Brauwesen*, München, 1908, Jahrg. 31, p. 421-425.) **† VTRA**

Propose a simpler and more convenient modification of the prevailing method, which determines the amount of sugar formed after the enzyme has acted on an excess of starch under standardized conditions.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 1126; *Chem. abst.*, 1908, v. 2, p. 3257; *Chem. Zentr.*, 1908, Bd. 2, p. 1383; *Bull. assoc. chimistes*, 1908-09, tome 26, p. 602; *Wag. Jahr.*, 1908, Jahrg. 54, Abt. 2, p. 283.

3187. Guyatt, R. New method for determining diastatic power in malt. (*Brewer's journal*, London, 1909, v. 45, p. 123-124.) **VTRA**

Starch solution is treated with malt extract at 21°, boiled with excess Fehling's solution and the precipitated CuO determined by weighing the mixture before and after filtration.

Abstract in *Chem. abst.*, 1909, v. 3, p. 1200.

3188. Harrison, E. F. Diastatic value of malt extract. (*Pharmaceutical journal and pharmacist*, London, 1909, v. 82, p. 388-390.)

Available in Library of the New York Academy of Medicine.

Starch solution is treated with malt extract at 40° for ½ hour, the action arrested

ases, continued.

determination of Saccharogenic Activity, continued.

boiling and the resulting maltose estimated by titration with Fehling's solution. Results for a number of commercial extracts.

Abstract in *Chem. abst.*, 1909, v. 3, p. 1323.

Ling, Arthur R. Determination of diastatic power of malt and of malt extract. (*Pharmaceutical journal and pharmacist*, London, 1910, v. 85, p. 267, 312.)

Available in Library of the New York Academy of Medicine.

Notes an inherent error in the method of Gair and Gair in that the observations of Kjeldahl are ignored; Kjeldahl has earlier shown that the diastatic power is proportional to the mass of malt extract, only not less than 40% maltose is formed.

Abstract in *Jour. soc. chem. ind.*, 1910, v. 29, p. 562; *Chem. abst.*, 1911, v. 5, p. 562.

Harrison, E. F. The determination of the diastatic power of malt extract. (*Pharmaceutical journal and pharmacist*, London, 1910, v. 85, p. 121-123.)

Available in Library of the New York Academy of Medicine.

Reply to the recent criticism of Ling.

Sherman, Henry C., and others. Studies on amylases. 1. An examination of methods for the determination of diastatic power. By H. C. Sherman, E. C. Kendall and E. D. Clark. (*American Chemical Society Journal*, Easton, 1910, v. 32, p. 1073-1079.)

PKA

Give critical review and experimental comparison of earlier methods. Describe method, expressing amylolytic activity as weight of starch (2.5 gr.) divided by minimum weight of enzyme preparation required to effect disappearance of iodine reaction after acting for 30 minutes at 40°. Using taka-diastase, the results closely parallel those obtained by Lintner's method, though pancreatin amylase gives erratic results in absence of electrolytes. Detail a gravimetric, copper-reduction method using minimum amounts of sodium chloride and sodium phosphate for activation.

Condensed in *Bull. assoc. chimistes*, 1911-12, tome 10, p. 388-390.

Abstract in *Jour. soc. chem. ind.*, 1910, v. 29, p. 564; *Chem. Zentr.*, 1910, Bd. 2, p. 1410; *Chem. Zentr.*, 1911, v. 5, p. 1615; *Jour. chem. soc.*, 1910, v. 2, p. 1012; *Bull. soc. chim. France*, 1911, 4, tome 10, p. 992.

Moreau, Edmond. Analyse biologique des miels. (*Annales des falsifications*, Paris, 1911, année 4, p. 145-148.)

VTD

Amylase is precipitated by absolute alcohol dissolved in water and allowed to act

on a solution of starch at 45-50° for 24 hours. Twelve samples yielded 0.60 to 3.68 grs. reducing sugar per 100 grs. of honey.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 564; *Chem. abst.*, 1911, v. 5, p. 2123; *Chem. Zentr.*, 1911, Bd. 1, p. 1382.

3193. Ling, Arthur R. Malting. 2. The production of diastase during flooring. (*Institutes of Brewing Journal*, London, 1912, v. 18, p. 436-458.)

VTRA

Includes method for determining diastatic activity when using small portions of material.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 740; *Bull. assoc. chimistes*, 1912-13, tome 30, p. 133-134.

3194. Monnier, M. A. Détermination du pouvoir diastasique des extraits de malt. (*Annales de chimie analytique*, Paris, 1914, tome 19, p. 51-54.)

PKA

Describes Lintner's method and suggests that a correction be made for preexisting sugars. Expresses results in terms of maltose produced by 100 gr. extract acting for 1 hour at 18°.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p. 271; *Jour. chem. soc.*, 1914, v. 106, part 2, p. 311; *Chem. Zentr.*, 1914, Bd. 1, p. 1306.

3195. Riedel, J. D. Untersuchungsergebnisse und Prüfungsvorschriften für Malzextrakte. (Auszug.) (*Chemisches Zentralblatt*, Berlin, 1914, Bd. 1, p. 1899.)

PKA

The amylolytic activity is expressed as amount of maltose formed by 100 grams of malt extract acting upon starch for ½ hour.

3196. Wolff, Ottomar. Über eine neue Methode zur Bestimmung der Fermentwirkung der Diastase. (*Chemiker-Zeitung*, Cöthen, 1915, Jahrg. 39, p. 105-107.)

†† VOA

Method depends on a determination of difference in the refraction of the initial starch and resulting sugar solutions by means of the Zeiss interferometer. Measures activity of saliva and Merck's diastase.

Abstract in *Chem. abst.*, 1915, v. 9, p. 2260; *Jour. chem. soc.*, 1915, v. 108, part 2, p. 296; *Chem. Zentr.*, 1915, Bd. 1, p. 574.

3197. Grimbert, L. Sur l'essai de la diastase officinale d'après le codex. (*Journal de pharmacie et de chimie*, Paris, 1916, série 7, tome 13, p. 1-16.)

Available in Library of the New York Academy of Medicine.

A more detailed modification of the method described in the French Codex, 1908.

Condensed in *Annales des falsifications*, Paris, 1916, année 9, p. 90-95.

Abstract in *Chem. abst.*, 1916, v. 10, p. 1078, 1909; *Chem. Zentr.*, 1916, Bd. 2, p. 31.

*Amylases, continued.**Determination of Saccharogenic Activity, continued.*

3198. Nowak, C. A. A rapid and exact method for determining the diastatic activity of germinated grain. (Pure products, New York, 1917, v. 13, p. 128-131.) **VTD**

The malt extract is heated with 2% soluble starch solution for 60 minutes at 22.5° and the resulting sugars titrated with Fehling's solution.

Abstract in *Chem. abst.*, 1917, v. 11, p. 1718.

3199. Wilson, L. C., and A. L. MINCHIN. Estimation of diastatic power: a suggestion. (Institutes of Brewing, Journal, London, 1919, v. 25, p. 65-67.) **VTRA**

Have found that in determining the diastatic power of malt by the method published by the Committee of the Institute of Brewing (*entry 3181*) it is unnecessary to extract the 25 grs. of malt for 3 hours, as prescribed; equally high results are obtained by 1 hour's extraction. — *Chem. abst.*

3200. Myers, Victor C., and ANNE G. DELLENBAUGH. Studies on the amylolytic activity of human saliva with a new method. (Society for Experimental Biology and Medicine, Proceedings, New York, 1918-19, v. 16, p. 18-20.)

Available in Library of the New York Academy of Medicine.

Dilute saliva, in the presence of NaCl, is incubated for 30 minutes at 40° with 1% starch solution and the resulting sugars determined by the picric acid colorimetric method.

Abstract in *Chem. abst.*, 1919, v. 13, p. 2688.

3201. Grimberty, L. Sur la détermination de pouvoir amylolytique de la salive. (Société de biologie, Comptes rendus, Paris, 1919, tome 82, p. 312-315.) **QAA**

Filtered saliva is incubated with 5% starch solution at 37-38° for 1 hour and the resulting maltose determined by the method of Bertrand.

Reprint in *Journal de pharmacie et de chimie*, Paris, 1919, v. 19, p. 244-250.

Abstract in *Chem. abst.*, 1919, v. 13, p. 2892; *Chem. Zentr.*, 1919, Bd. 4, p. 38; *Bull. soc. chim. France*, 1920, série 4, tome 27, p. 180.

3202. Adams, Edwin W. Method for evaluating diastase products for textile work. (Color trade journal, New York, 1920, v. 7, p. 170.) **† VOA**

A portion of the sample is warmed at 21° with 2% starch solution for 1 hour, standard Fehling solution added and the weight of the cuprous oxide determined.

3203. Flohil, J. T. Volumetric method for the determination of diastatic power. (Journal of industrial and engineering chemistry, Easton, 1920, v. 12, p. 677.) **VOA**

The enzyme preparation is allowed to act on 2% soluble starch solution at 20° for 1 hour, the action stopped with NaOH, the mixture diluted and boiled with Fehling's solution and the reduced copper determined by adding KI solution and sulphuric acid and titrating with thiosulphate solution. The results are calculated into Lintner degrees.

Abstract in *Jour. soc. chem. ind.*, 1920, v. 39, p. 580A; *Chem. Zentr.*, 1920, Bd. 4, p. 369; *Chimie et industrie*, 1921, v. 6, p. 177.

3204. Mauban, H. Mesure quantitative de la lipase et de l'amylase du suc pancréatique extrait par tubage duodénal direct. (Société de biologie, Comptes rendus, Paris, 1920, tome 83, p. 130-131.) **QAA**

Tubes containing 0.2% starch paste and varying quantities of the duodenal fluid are warmed for 5 minutes at 37°. Fehling's solution and K₂Fe(CN)₆ are added to each tube and, after boiling, the first tube which has turned colorless is noted.

Reprinted in *Journal de pharmacie et de chimie*, 1920, tome 21, p. 355-356.

Abstract in *Chem. abst.*, 1920, v. 14, p. 3092; *Chem. Zentr.*, 1920, Bd. 2, p. 681.

3205. Oshima, Kokichi. Technical method for the determination of the saccharogenic power of diastatic preparations. (Journal of industrial and engineering chemistry, Easton, 1920, v. 12, p. 991-993.) **VOA**

Discusses Lintner's method. Recommends method in which the enzyme is left in contact with a 2% starch solution at 40°, the reaction being stopped by NaOH at the end of 30 minutes and graduated quantities of the digest poured into a series of tubes containing 5 c.c. Fehling's solution. Thus knowing the smallest amount required to reduce 5 c.c. Fehling's solution, the Lintner value may be calculated by the method given.

Abstract in *Chem. Zentr.*, 1921, Bd. 2, p. 428.

3206. Rosenblum, Edward I. A note on the determination of diastatic activity. (Society of Chemical Industry, Journal, London, 1920, v. 39, p. 311-313T.) **VOA**

Using the method of Harrison and Gair, investigates influence of H ion concentration.

Abstract in *Chem. abst.*, 1921, v. 15, p. 607; *Chem. Zentr.*, 1921, Bd. 2, p. 1024; *Chimie et industrie*, 1921, v. 6, p. 220.

3207. Baker, Julian L., and H. F. E. HULTON. Iodimetric determination of the dia-

ases, continued.

mination of Saccharogenic Activity, continued.

power of malts. (Analyst, London, v. 46, p. 90-93.)

PKA

utilize the fact that I in the presence of H effects the quantitative oxidation of ose to maltobionic acid. The preliminary stages are carried out as in the Ling method, the action stopped by NaOH at end of 1 hour, standardized iodine solution added, the mixture acidified with sulfuric acid and titrated back with thiosulfate, the excess starch serving as an indicator. Give comparative results obtained by the Ling and by the iodine methods.

Abstract in *Chem. abst.*, 1921, v. 15, p. 1778; *Chem. Zentr.*, 1921, Bd. 2, p. 1024; *Bull. assoc. chimistes*, 1921-22, tome 39, p. 245; *Bull. soc. chim.*, 1921, série 4, tome 30, p. 1114.

Roeder, Georg. Vereinfachungen bei Anwendung der Methoden zur Bestimmung der diastatischen Kraft des Malzes (Lintner-Wirth in der Praxis. (Wochenschrift für Brauerei, Berlin, 1921, Jahrg. 5-7.)

Available in Library of the Department of Agriculture.

The malt extract is allowed to act on starch solution for 1/2 hour at 17.5° instead of 1 hour at 21°.

Abstract in *Jour. soc. chem. ind.*, 1921, v. 40, p. 454; *Chem. abst.*, 1921, v. 15, p. 2689; *Chem. Zentr.*, 1921, Bd. 2, p. 454.

Windisch, W., and P. Kolbach. Die Bestimmung der diastatischen Kraft des Malzes. (Wochenschrift für Brauerei, Berlin, 1921, Jahrg. 38, p. 149-151.)

Available in Library of the Department of Agriculture.

Propose a modification of Baker and Huls's iodometric method. The malt extract allowed to act on a 2% solution of Kahlbaum's soluble starch for 30 minutes at 20°, the maltose determined as before. A correction is made for the I absorbed by malt extract. The saccharogenic activity or diastatic power is expressed as grams maltose produced per 100 grams malt.

Abstract in *Chem. abst.*, 1922, v. 16, p. 2659; *Chem. Zentr.*, 1921, Bd. 4, p. 966; *Chimie et industrie*, 1922, v. 7, p. 984.

Damade, R. Méthode pour l'examen chimique du liquide duodénal retiré par lavage. (Société de biologie, Comptes rendus, Paris, 1922, tome 86, p. 947-948.) **QAA**

For the determination of amylase the sample is digested with starch paste for 1 hour at 37° and the resulting sugars determined with Bonnan's liquid:

Standard methods of malt analysis. Report of Standing Committee on Anal-

ysis. (Institutes of Brewing, Journal, London, 1922, v. 28, p. 775-786.) **VTRA**

Report includes the re-introduction of the "tube" method for estimating diastatic activity. More exact details for the preparation of soluble starch are laid down.

Abstract in *Jour. soc. chem. ind.*, 1922, v. 41, p. 911A.

3212. Windisch, W., and others. Über die Bestimmung der diastatischen Kraft. Von W. Windisch, W. Dietrich, P. Kolbach und A. Caspary. (Wochenschrift für Brauerei, Berlin, 1922, Jahrg. 39, p. 213-214, 219-222, 225-226.)

Available in Library of the Department of Agriculture.

Give evidence that divergent results obtained by the iodometric method are due to variations in degree of dispersion and pH of the starch solutions. Determine upper and lower limits of acidity for diastatic action. Detail an iodometric method for determination of diastatic activity, using Kahlbaum's soluble starch as substrate.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1860; *Chem. Zentr.*, 1923, Bd. 2, p. 46-48; *Bull. assoc. chimistes*, 1922-23, tome 40, p. 498-500; *Chimie et industrie*, 1923, v. 9, p. 782.

3213. Fabre, R., and H. Péneau. Recherches sur les ferments amylolytiques. (Journal de pharmacie et de chimie, Paris, 1923, série 7, tome 28, p. 289-304, 341-348.)

Available in Library of the Chemists' Club.

Investigate conditions influencing determinations of saccharogenic power of pancreatin and malt diastase preparations, using potato starch as substrate. The pH of the water used in preparation of starch and presence of activating electrolytes are shown to be important factors. Note the formation of dextrose in hydrolysis by pancreatin.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1308; *Jour. soc. chem. ind.*, 1924, v. 43, p. 27B; *Chem. Zentr.*, 1924, Bd. 1, p. 1398, 2437.

3214. Fyfe, G. Matthew. A method of estimation of diastase in blood. (British journal of experimental pathology, London, 1923, v. 4, p. 127-131.)

Available in Library of the New York Academy of Medicine.

Blood sugar is first determined by McLean's method and then a similar determination is carried out after the blood has been incubated for 1/2 hour at 37° with 0.1% starch solution.

Abstract in *Chem. abst.*, 1923, v. 17, p. 3351; *Chem. Zentr.*, 1924, Bd. 2, p. 1253.

3215. Machida, E., and S. Kitayama. Application of iodometry to estimation of diastatic power. (Abstract.) (Chemical abstracts, Easton, 1925, v. 19, p. 1722.) **PKA**

MOULD, FUNGUS, YEAST AND BACTERIAL AMYLASES

3216. Guyton. Sur le sucre. (Annales de chimie, Paris, série 1, tome 25, 1798, p. 37-50.) **PAA**

Notes that starches yield sugar by fermentation.

3217. Clément. Lettre sur la fermentation alcoolique de l'amidon. (Annales de chimie, Paris, série 2, tome 5, 1817, p. 422-423.) **PAA**

Asserts that starch may be fermented without intermediate conversion to sugars.

3218. Muentz, A. Sur les ferments chimiques et physiologiques. (Académie des sciences, Comptes rendus, Paris, 1875, tome 80, p. 1250-1253.) ***EO**

The decomposition of starch by enzymes and by living organisms is differentiated by the use of chloroform.

Abstract in *Chem. Centr.*, 1875, p. 534.

3219. Béchamp, Auguste. Sur les microzymas de l'orge germée et des amandes douces, comme producteurs de la diastase et de la synaptase, à propos d'une note de MM. Pasteur et Joubert. (Académie des sciences, Comptes rendus, Paris, 1876, tome 83, p. 358-361.) ***EO**

The "microzymas" dissolve and saccharify starch.

Abstract in *Jahresber. Chem.*, 1876, p. 951.

3220. Dahlem, J. P. Die chemische Ursache der Umsetzung der Stärke in Zucker, des Zuckers in Alkohol etc. bei Anwesenheit von Pilzorganismen. (Auszug.) (Chemisches Central-Blatt, Leipzig, 1876, p. 118.) **PKA**

3221. Fitz, Albert. Ueber Schizomyceten-Gährungen, 2. Glycerin, Mannit, Stärke, Dextrin. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1877, Jahrg. 10, p. 276-283.) **PKA**

Abstract in *Jahresber. Chem.*, 1877, p. 1019-1021.

3222. — Ueber Schizomyceten-Gährungen, 3. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1878, Jahrg. 11, p. 42-55.) **PKA**

Fermentation of 100 parts of air-dried starch yielded 35 parts of butyric acid and 9 parts of acetic acid.

3223. Korschelt, O. Ueber Sake, das alkoholische Getränk der Japaner. (Dingler's polytechnisches Journal, Augsburg, 1878,

Bd. 230, p. 76-80, 172-181, 229-240, 330-335, 421-427.) **3-VA**

Describes use of *Eurotium oryzae* for the saccharification of rice starch in the preparation of sake.

Abstract in *Wag. Jahr.*, 1880, Jahrg. 26, p. 628.

3224. Atkinson, R. W. Brewing in Japan. (Chemical news, London, 1881, v. 44, p. 230-233.) **PKA**

Gives details of the preparation of koji.

Abstract in *Jour. chem. soc.*, 1882, v. 42, p. 432-434.

3225. — On the diastase of *kôji*. (Royal Society of London, Proceedings, 1881, v. 32, p. 299-322.) ***EC**

A very detailed description. Plates are given.

Reprinted in *Moniteur scientifique du docteur Quesneville*, Paris, 1882, tome 24, p. 7-33.

Abstract in *Chem. news*, 1880, v. 41, p. 169; *Jour. chem. soc.*, 1881, v. 40, p. 1059; *Wag. Jahr.*, 1880, Jahrg. 26, p. 629.

3226. Marcano, V. Fermentation de la fécule. Présence d'un vibron dans la graine de maïs qui germe et dans la tige de cette plante. (Académie des sciences, Comptes rendus, Paris, 1882, tome 95, p. 345-347.) ***EO**

Describes a highly characteristic organism present in Indian corn which converts starch to dextrins, alcohol, and CO₂. The organism is not destroyed by boiling water.

Abstract in *Jour. chem. soc.*, 1882, v. 42, p. 1311.

3227. — Fermentation directe de la fécule. Mécanisme de cette métamorphose (Académie des sciences, Comptes rendus, Paris, 1882, tome 95, p. 856-859.) ***EO**

The action of the organism described in entry 3226 is shown to be due to the formation of a diastase.

Abstract in *Jour. chem. soc.*, 1883, v. 44, p. 365; *Chem. Centr.*, 1882, p. 806; *Ber.*, 1882, Jahrg. 15, p. 3089.

3228. Wortmann, Julius. Untersuchungen über das diastatische Ferment der Bakterien. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Strassburg, 1882, Bd. 6, p. 287-329.)

Available in Library of the New York Academy of Medicine.

Abstract in *Jour. chem. soc.*, 1883, v. 40, p. 930; *Ber.*, 1882, Jahrg. 15, p. 2269; *Jahresber. Chem.*, 1882, p. 1247.

3229. Busgen, M. *Aspergillus oryzae*. (Deutsche botanische Gesellschaft, Berichte, Berlin, 1885, Bd. 3, p. 66-71.)

Available in Library of Columbia University.

ses, continued.

, Fungus, Yeast and Bacterial Amy-
ses, continued.

Béchamp, Auguste. Du rôle de la
dans les fermentations butyrique et
ie, et des organismes actuellement
s qu'elle contient. (Académie des sci-
Comptes rendus, Paris, 1886, tome
451-455.) *EO

ds certain organisms in chalk which
pable of directly fermenting starch.

Gayon, U., and E. DUBOURG. Sur la
ntation alcoolique de la dextrine et de
on. (Académie des sciences, Comptes
s, Paris, 1886, tome 103, p. 885-887.)

*EO
ve discovered a new ferment in a spec-
of mucor which possesses the double
rty of saccharifying both dextrin and
and of fermenting the products. Also
that *Eurotium oryzae*, used in the man-
re of "koji," secretes a diastase which
rts rice into a true malt.

ted in further detail in *Annales de la science
nique française et étrangère*, Paris, 1887, année
1, p. 419-437, VPA.

tract in *Jour. soc. chem. ind.*, 1887, v. 6, p. 144;
Chem. soc., 1887, v. 52, p. 171; *Bull. soc. chim.*
1887, tome 47, p. 649; *Ber.*, 1887, Jahrg. 20,
3; *Jahresber. Chem.*, 1888, p. 2499.

Goldschmidt, Harald. Zur Frage:
lt die Luft lebende auf Stärke ver-
nd wirkende Fermente? (*Zeitschrift
ysiologische Chemie*, Hoppe-Seyler's,
sburg, 1886, Bd. 10, p. 299-301.) PKA

tract in *Jour. chem. soc.*, 1886, v. 50, p. 726-
hresber. Chem., 1886, p. 1889.

Frankland, P. F., and others. Con-
ions to the study of pure fermenta-
P. F. Frankland, G. C. Frankland and
x. (*Chemical news*, London, 1889, v.
187.) PKA

gest that the term *Bacillus ethace-*
be applied to an organism which fer-
s starch and other carbohydrates.

tract in *Jahresber. Chem.*, 1889, p. 2196-2197.

Fermi, Claudio. Die Leim und
n lösenden und die diastatischen Fer-
er der Mikroorganismen. (*Archiv für
ene*, München and Leipzig, 1890, Bd.
1-54.) SPA

tract in *Chem. Centr.*, 1890, Bd. 1, p. 537-539.

Raumer, Ed. von. Über das Ver-
a verschiedener Hefearten gegenüber
Dextrinen des Honigs und des Kar-
zuckers. (*Zeitschrift für angewandte
ie*, Berlin, 1890, Jahrg. 3, p. 421-423.) PKA

tract in *Chem. Centr.*, 1890, Bd. 2, p. 395.

3236. **Medicus, L., and C. IMMERHEISER.**
Zur Frage der Vergärbarkeit von Dextrinen.
(*Zeitschrift für analytische Chemie*, Wies-
baden, 1891, Jahrg. 30, p. 665-669.) PKA

Dextrin, in the presence of phosphates
and at a favorable temperature, is com-
pletely fermented by vigorous pressed
yeast. Complete fermentability of the
dextro-rotatory constituents of wine is
therefore not positive evidence against
adulteration with potato-starch sugar.

Abstract in *Jour. chem. soc.*, 1892, v. 62, p. 922;
Chem. Centr., 1892, Bd. 1, p. 722.

3237. **Sclavo, A., and B. GOSIO.** Sur une
nouvelle fermentation de l'amidon. (*Ar-
chives italiennes de biologie*, Paris, 1891,
tome 14, p. 154-156.) QAA

Give description and preparation of *B.*
suaveolens, which converts starch gradually
into dextrin and glucose with formation of
alcohol, aldehyde, formic-, acetic-, and
butyric acids, together with certain esters of
an agreeable odor.

Abstract in *Jour. chem. soc.*, 1891, v. 60, p. 1284;
Chem. Centr., 1891, Bd. 2, p. 253; *Jahresber. Chem.*,
1890, p. 2303.

3238. **Villiers, A.** Sur la transformation de
la fécule en dextrine par le ferment buty-
rique. (Académie des sciences, Comptes
rendus, Paris, 1891, tome 112, p. 435-437.)

*EO
A cultivation of *Bacillus amylobacter* con-
verts starch into dextrin without the for-
mation of maltose or glucose.

Reprinted in *Bull. soc. chim. Paris*, 1891, série 3,
tome 5, semestre 1, p. 468-470.

Abstract in *Jour. soc. chem. ind.*, 1891, v. 10, p.
474; *Jour. chem. soc.*, 1891, v. 60, p. 659; *Chem.*
Centr., 1891, Bd. 1, p. 658.

3239. — Sur la fermentation de la fécule
par l'action du ferment butyrique. (Acadé-
mie des sciences, Comptes rendus, Paris,
1891, tome 112, p. 536-538.) *EO

Dextrin is the principal product of fer-
mentation by *B. amylobacter* (entry 3238).
The author describes here two products
which are formed in small quantities, one a
crystalline disaccharide termed cellulose
and the other an amorphous substance with
the composition of cellulose.

Reprinted in *Bull. soc. chim. Paris*, 1891, série 3,
tome 5, semestre 1, p. 470-472.

Abstract in *Jour. soc. chem. ind.*, 1891, v. 10, p.
717; *Chem. Centr.*, 1891, Bd. 1, p. 830; *Jour. chem.*
soc., 1891, v. 60, p. 660.

3240. — Sur le mode d'action du fer-
ment butyrique dans la transformation de
la fécule en dextrine. (Académie des sci-
ences, Comptes rendus, Paris, 1891, tome
113, p. 144-145.) *EO

The butyric ferment secretes a soluble
product capable of converting starch into
dextrin in the absence of any organized fer-

*Amylases, continued.**Mould, Fungus, Yeast and Bacterial Amylases, continued.*

ment. This substance is formed continuously in small quantities and its activity is exhausted almost as rapidly as it is formed.

Abstract in *Jour. chem. soc.*, 1891, v. 60, p. 1446; *Chem. Centr.*, 1891, Bd. 2, p. 549.

3241. Béchamp, Auguste. La fermentation directe de l'empois d'amidon et du sucre de canne. (Société chimique de Paris, Bulletin, 1892, série 3, tome 7, p. 753-754.) **PKA**

Notes the presence of microorganisms in certain chalks which are capable of fermenting starch directly.

Abstract in *Chem. Centr.*, 1893, Bd. 1, p. 220.

3242. Calmette. Contribution à l'étude des ferments de l'amidon. La levure chinoise. (Institut Pasteur, Annales, Paris, 1892, tome 6, p. 604-620.) **QDA**

Describes a mould which he has isolated from Chinese yeast and termed *Amylomyces rouxii*. Outlines its use in the production of alcohol from rice in China.

Abstract in *Chem. Centr.*, 1893, Bd. 1, p. 43.

3243. Fermi, Claudio. Beitrag zum Studium der von den Mikroorganismen abgesonderten diastatischen und Inversionsfermente. (Centralblatt für Bakteriologie, Jena, 1892, Bd. 12, p. 713-715.) **QDA**

Abstract in *Chem. Centr.*, 1893, Bd. 1, p. 103.

3244. Perdrix, L. A ferment producing amyl alcohol from starch. (Abstract.) (Society of Chemical Industry, Journal, London, 1892, v. 11, p. 699.) **†VOA**

Also abstracted in *Zeitschrift für Spiritusindustrie*, Berlin, 1891, N. F., Jahrg. 14, p. 176-177.

3245. — A bacterium which ferments starch and produces amyl alcohol. (Abstract.) (Chemical Society, Journal, London, 1892, v. 62, p. 90.) **PKA**

By the action of *B. amylozymicus*, 6% of the starch is converted to dextrins and the remainder into sugar, CO₂, ethyl and amyl alcohols and acetic and butyric acids; the sugar resembles glucose but is not identical in all characteristics.

Also abstracted in *Chem. Centr.*, 1891, Bd. 2, p. 252-253.

3246. Reinke, Otto. Die Vergärung von Maltosen und Maltodextrinen. (Wochenschrift für Brauerei, Berlin, 1892, Jahrg. 9, p. 620-621.)

Available in Library of the Brewers' Academy.

Believes that maltodextrin is present in beer wort. The dextrin is not fermentable

by Saaz yeast but is fermentable by Froberg yeast.

Abstract in *Wag. Jahr.*, 1892, Jahrg. 38, p. 886.

3247. Beijerinck, Martinus W. Sur la fermentation butylique et le ferment butylique. (Recueil de travaux chimiques du Pays-Bas, Leide, 1893, tome 12, p. 141-153.) **PKA**

Observes the presence of amylase, which converts starch into maltose and dextrin, in the organism *Granulobacter butylicum*.

Abstract in *Jour. soc. chem. ind.*, 1894, v. 13, p. 167.

3248. Maumus. Sur la transformation de l'amidon végétal en sucre par le bacille du charbon. (Société de biologie, Comptes rendus, Paris, 1893, tome 5, p. 107-109.) **QAA**

3249. Duclaux, E. Sur la nutrition intracellulaire. (Institut Pasteur, Annales, Paris, 1895, tome 9, p. 811-839.) **QDA**

Studies action of *Amylobacter butylicus* and *Amylobacter ethylicus* on starch.

Abstract in *Chem. Centr.*, 1896, Bd. 1, p. 122.

3250. Morris, G. Harris. The hydrolysis of maltose by yeast. (Chemical Society of London, Proceedings, 1895, v. 11, p. 46-47.) **PKA**

Includes the observation that dry yeast has the power of liquefying starch paste and of producing dextrose from certain starch conversion products.

3251. Laer, Henri van, and DENAMUR. Notice sur une levure à atténuation-limite très élevée. (Moniteur scientifique du docteur Quesneville, Paris, 1895, tome 46, p. 499-503.)

Available in Library of Columbia University.

Discuss fermentability of starch degradation products.

Abstract in *Jour. soc. chem. ind.*, 1895, v. 14, p. 817.

3252. Boidin, A., and E. ROLANTS. Contribution à l'étude de l'utilisation de l'*Amylomyces rouxii*, de la levure chinoise dans les industries de fermentation en Europe. (Association des chimistes, Bulletin, Paris, 1896-97, tome 14, p. 908-914.) **VOA**

Study role of the *amylomyces* in the saccharification and fermentation of rice and the influence of acidity on the saccharification.

3253. Rothenbach, F. Die Dextrin vergärende Hefe *Schizosaccharomyces pombe* und ihre eventuelle Einführung in die Praxis. (Zeitschrift für Spiritusindustrie,

ases, continued.

d, Fungus, Yeast and Bacterial Amylases, continued.

h, 1896, N. F., Jahrg. 19, p. 58-59, 71, 104-105, 111-112, 119-120.)

available in Library of the Patent Office. Describes Pombé yeast which is capable of fermenting dextrins.

ndensed in *Bull. assoc. chimistes*, 1897-98, tome 577-680.

Visite de la distillerie centrale de M. Ste Collette à Séclin. (Association des distilleries de sucrerie et de distillerie, Bulletin, Paris, 1897-98, tome 15, p. 1085-1090.)

VOA

Describes the new process for fermentation of starchy materials using the mould *Amylomyces rouxii*.

Laborde, J. Recherches physiologiques sur une moisissure nouvelle l'*Euphysa gayoni*. (Institut Pasteur, Annales, 1897, année 11, p. 1-43.)

QDA

Describes a mould found on starch paste, which converts starch, dextrin and maltose to glucose.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 16, p. 699.

Lévy, M. L. Du rôle des moisissures en distillerie. (Association des chimistes, Bulletin, Paris, 1897-98, tome 15, p. 998-1000.)

VOA

Discusses the following moulds, all of which are capable of effecting the saccharification of starch: *Aspergillus niger*, *Aspergillus oryzae*, *Amylomyces rouxii*, *Clamydomyces oryzae*, *Rhizopus oryzae*, and *Mutinus*.

Sanguinetti, J. Contribution à l'étude de l'*Amylomyces rouxii* de la levûre de bière et des moisissures fermentaires de bière. (Institut Pasteur, Annales, Paris, 1897, tome 11, p. 264-276.)

QDA

Studies action of *A. oryzae*, *Mucor alter* and *A. rouxii*.

Printed in *Bull. assoc. chimistes*, 1897-98, tome 567-677.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 16, p. 699; *Chem. Centr.*, 1897, Bd. 1, p. 998.

Boidin, A. Sur les mucédinées en distillerie. Procédé Collette et Boidin. (Association des chimistes, Bulletin, Paris, 1899, tome 16, p. 862-869.)

VOA

Confirms earlier results, that mucédinées are capable of yielding more alcohol from starch than the theoretical amount calculated by Pasteur's equation. Compares re-

sults obtained at the Seclin distillery when using *Amylomyces rouxii* and *Mucor* α , β , and γ .

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 699.

3259. Effront, Jean. Verfahren zur Vergärung von Dextrin-Maischen mit Hilfe einer akklimatisierten Hefe. (Zeitschrift für Spiritusindustrie, Berlin, 1898, N. F., Jahrg. 21, p. 298.)

Available in Library of the Patent Office.

Abstract in *Wag. Jahrb.*, 1898, Jahrg. 44, p. 872.

3260. Jean, Ferdinand. Emploi des moisissures en distillerie. (Revue de chimie industrielle, Paris, 1898, année 9, p. 329-334.)

VOA

Includes discussion of relative saccharifying powers of *Aspergillus oryzae* and *Amylomyces rouxii*.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 157.

3261. Stone, Winthrop E., and H. E. Wright. Notes on taka-dia-*stase*. (American Chemical Society, Journal, Easton, 1898, v. 20, p. 639-647.)

PKA

Potato starch paste was subjected, under identical conditions, to the actions of taka-dia-*stase* and malt dia-*stase*. Taka-dia-*stase* caused a more rapid decrease in optical rotation and showed a higher rate of saccharification, but the last traces of starch, as shown by the iodine reaction, did not disappear as quickly.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 1063; *Chem. Centr.*, 1898, Bd. 2, p. 895.

3262. Takamine, Jokichi. Diastatic substances from fungus growths. (Society of Chemical Industry, Journal, London, 1898, v. 17, p. 118-120.)

VOA

Describes preparation of taka-dia-*stase*. The enzyme does not give the guaiacum reaction and the ratio of amyloclastic to saccharogenic activity is considerably higher than for malt amylase.

Abstract in *Chem. Centr.*, 1898, Bd. 1, p. 993.

3263. Buchner, Eduard, and RUDOLF RAPP. Alkoholische Gärung ohne Hefezellen. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1899, Jahrg. 32, p. 2086-2094.)

PKA

An active extract is obtained by triturating yeast with kieselgühr and sand and filtering under pressure. Note that starch is not fermented by the extract but that "soluble starch" and dextrins are readily fermented.

Abstract in *Jour. chem. soc.*, 1899, v. 76, part 2, p. 606; *Bull. soc. chim. Paris*, 1900, série 3, tome 24, p. 362.

Amylases, continued.

Mould, Fungus, Yeast and Bacterial Amylases, continued.

3264. Folth. La fermentation par les mucédinées. (Extrait.) (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1899-1900, tome 17, p. 951.) **VOA**

A report on the use of *Amylomyces rouxii*. The author was director of the distillery which carried out the second industrial application of the process. American maize was used as raw material.

3265. Marbach, Adolf. Ueber *Amylomyces rouxii* und die industrielle Bedeutung des Amylo-Gärverfahrens. (Oesterreichische Chemiker-Zeitung, Wien, 1899, Jahrg. 2, p. 178-181.)

Available in Library of the Department of Agriculture.

Discusses the history and application of the enzyme.

Abstract in *Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1900, Bd. 3, p. 50.

3266. Wróblewski, Augustin. Ueber den Hefepresssaft. 2. (Académie des sciences de Cracovie, Bulletin international, 1899, p. 115-122.) ***QPA**

Shows the presence of a starch transforming enzyme in the extract expressed from commercial yeast.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 598.

3267. The Colette-Boidin process. (Engineering, London, 1900, v. 70, p. 523-526.) **††VDA**

A higher saccharifying efficiency is claimed for the ferment *Mucor* β , in use at the Seclin distillery. Photographs are given.

3268. Kozai, Y. Chemische und biologische Untersuchungen über Sake-Bereitung. (Centralblatt für Bakteriologie, Jena, 1900, Abt. 2, Bd. 6, p. 385-405.) **QAA**

Notes that the enzyme *Aspergillus oryzae* forms dextrose from starch and that it is inactive in solutions containing as much as 28% alcohol.

Abstract in *Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, 1901, Bd. 4, p. 211-212; *Jour. soc. chem. ind.*, 1901, v. 20, p. 378.

3269. Sitnikoff, A., and W. Rommel. Vergleichende Untersuchungen über einige sogenannte *Amylomyces*-Arten. (Wochenschrift für Brauerei, Berlin, 1900, Jahrg. 17, p. 621-625.) **†VTRA**

With a partially saccharified starch paste, *Mucor* α produced about 50% saccharification and 3.4% of alcohol, whilst *Mucors* β

and γ gave complete saccharification but only 1.5% of alcohol.

Abstract in *Jour. soc. chem. ind.*, 1900, v. 19, p. 1128.

3270. Wehmer, C. Studien über technische Pilze. 7. Die "Chinesische Hefe" und der sogenannte *Amylomyces* (*Mucor rouxii*) (Centralblatt für Bakteriologie, Jena, 1900, Abt. 2, Bd. 6, p. 353-365.) **QAA**

Abstract in *Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1900, Bd. 4, p. 212-213; *Jour. soc. chem. ind.*, 1901, v. 20, p. 377; *Chem. Centr.*, 1900, Bd. 2, p. 55.

3271. Calmette. Method of producing glucose, by the aid of *Mucedinae*. (Abstract.) (Society of Chemical Industry, Journal, London, 1901, v. 20, p. 140.) **VOA**

3272. Chrzaszcz, Tadeusz. Die "Chinesische Hefe." *Mucor cambodia*, eine neue technische Pilzart; nebst einigen Beobachtungen über *Mucor rouxii*. (Centralblatt für Bakteriologie, Jena, 1901, Abt. 2, Bd. 7, p. 326-338.) **QDA**

Notes that starch is saccharified by *Mucor cambodia*, though not as powerfully as by *Mucor rouxii*.

Abstract in *Jour. soc. chem. ind.*, 1901, v. 20, p. 757.

3273. Eijkman, C. Über Enzyme bei Bakterien und Schimmelpilzen. (Centralblatt für Bakteriologie, Jena, 1901, Abt. 1, Bd. 29, p. 841-848.) **QDA**

Includes study of amylolytic enzymes.

Abstract in *Chem. Centr.*, 1901, Bd. 2, p. 702.

3274. Pozzi-Escot, Emm. Recherches sur les ferments diastasiques de l'Eurotium oryzae. (Association des chimistes, Bulletin, Paris, 1902-03, tome 20, p. 282-285.) **VOA**

Discusses saccharification of the starch in rice by the amylase of *Eurotium oryzae*.

3275. Turquet, J. Sur le mode de végétation et de reproduction de l'*Amylomyces rouxii*, champignon de la levure chinoise. (Académie des sciences, Comptes rendus, Paris, 1902, tome 135, p. 912-915.) ***EO**

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 222.

3276. Vuillemin, Paul. Sur les effets du commensalisme d'un *amylomyces* et d'un micrococcus. (Académie des sciences, Comptes rendus, Paris, 1902, tome 134, p. 366-368.) ***EO**

Abstract in *Jour. chem. soc.*, 1902, v. 82, part 2, p. 343; *Chem. Centr.*, 1902, Bd. 1, p. 732.

3277. Desmots, H. Production de l'acétyle-méthylcarbinol par les bactéries du groupe du *Bacillus mesentericus*. (Académie des

ases, continued.

id, Fungus, Yeast and Bacterial Amylases, continued.

aces, Comptes rendus, Paris, 1904, tome p. 581-583.) *EO

he bacilli investigated attack starch and carbohydrates with formation of acetic valeric acid, ethyl alcohol and acetyl-methylcarbinol.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 2, 5; *Bull. soc. chim. Paris*, 1905, série 3, tome 33, 5.

Pozzi-Escot, Emm. Nouveau procédé de fermentation des matières amyloses. (Association des chimistes de sucre et de distillerie, Bulletin, Paris, tome 1904-05, p. 765-777.) VOA

Abstract in *Chem. Centr.*, 1905, Bd. 1, p. 1442.

Saito, K. Eine neue Art der "Chihen Hefe." (Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Jena, 1904, Abt. 2, Bd. 13, p. 153-154.) QDA

describes two mould fungi, *Rhizopus* *oviformis* and *Rhizopus* *tritici*, which saccharify starch with the production of alcohol esters.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 1289; *Chem. Centr.*, 1905, Bd. 1, p. 40.

Fermi, Claudio. Die saccharifizierende Wirkung des *Bac. tuberculosis*. (Centralblatt für Bakteriologie und Parasitenkunde, Jena, 1906, Abt. 1, Bd. 40, p. 187-188.) QDA

Notes the formation of sugar from potato starch by action of *Bac. tuberculosis*.

Abstract in *Chem. Centr.*, 1906, Bd. 1, p. 1179.

Kruffy, E. de. Die Amylasemikroorganismen. (Auszug.) (Chemisches Zentralblatt, Berlin, 1906, Bd. 2, p. 1349.) PKA

Ossendovsky, A. M. Two varieties of moulds cultivated in Japan and China. (Translated.) (Russian Physical Chemistry Society, Journal, 1906, tome 38, p. 10-1071.)

Available in Library of the Chemists' Society.

describes the amylase of *Aspergillus* *oryzae* and *Mucor* *rouxii*.

Abstract in *Bull. soc. chim. France*, 1908, série 4, tome 4, p. 1570.

Effront, Jean. Sur l'action chimique des spores. (Moniteur scientifique du docteur Quesneville, Paris, 1907, série 4, tome 10, p. 81-87.) OA

When a solution containing soluble starch, coagulated egg-albumin, and a small

proportion of sodium phosphate is heated in an autoclave for two hours at 110°, and afterwards maintained at 45°, the starch and albumin undergo considerable hydrolysis, which is caused by diastatic and proteolytic enzymes secreted by spores of *Bacillus subtilis*.

Abstract in *Chem. abst.*, 1907, v. 1, p. 1160; *Jour. soc. chem. ind.*, 1907, v. 26, p. 162; *Chem. Centr.*, 1907, Bd. 1, p. 834.

3284. — Sur le pouvoir diastasique du "Bacillus subtilis." (Congresso internazionale di chimica applicata, 6th, Rome, 1907, Atti, v. 4, p. 125-132.) PKR

3285. Okazaki, K. Eine neue *Aspergillus*-Art und ihre praktische Anwendung. (Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Jena, 1907, Abt. 2, Bd. 19, p. 481-484.) QDA

Discovers on putrefying rice-koji a fungus, "*Aspergillus okazaki*." Notes that it is capable of saccharifying starch paste.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 1289; *Chem. Centr.*, 1908, Bd. 1, p. 146.

3286. Saito, K. Mikrobiologische Studien über die Soyabereitung. (Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Jena, 1907, Abt. 2, Bd. 17, p. 101-109.) QDA

Notes that the amylolytic action of koji diastase is injured by the presence of NaCl.

3287. Schardinger, Franz. Verhalten von Weizen- und Roggenmehl zu Methylenblau und zu Stärkekleister, nebst einem Anhang über die Bildung höherer Alkohole durch hitzbeständige Mikroorganismen aus Weizenmehl. (Centralblatt für Bakteriologie, Jena, 1907, Abt. 2, Bd. 18, p. 748-767.) QDA

A specific difference in the actions of wheat and rye meal on starch paste is attributed to the presence of enzymes.

Abstract in *Chem. Centr.*, 1907, Bd. 2, p. 271.

3288. Zellner, Julius. Zur Chemie der höheren Pilze. 3. Über Pilzdiastasen. (Monatshefte für Chemie, Wien, 1909, Bd. 30, p. 231-247.)

Available in Library of Columbia University.

The amylases of two fungi species are investigated. Determines optimum temperature, behavior towards acids or alkalis and relative activity.

Abstract in *Bull. soc. chim. France*, 1910, série 4, tome 8, p. 653.

3289. — Zur Chemie der höheren Pilze. 4. Über Maltasen und glucosidspaltende

Amylases, continued.

Mould, Fungus, Yeast and Bacterial Amylases, continued.

Fermente. (Monatshefte für Chemie, Wien, 1909, Bd. 30, p. 655-662.)

Available in Library of Columbia University.

Work includes study of the starch decomposition products resulting from action of fungus extract. Dextrins are precipitated with alcohol and the rotatory power of the filtrate determined.

Abstract in *Chem. Zentr.*, 1909, Bd. 2, p. 1668.

3290. Wehmer, C. Die Pilzverzuckerung im Gärungsgewerbe. (Auszug.) (Chemisches Zentralblatt, Berlin, 1909, Bd. 2, p. 1087.) **PKA**

Detailed discussion.

3291. Muentzer, F. Über Enzyme. 2. Versuche mit Diastase des *Aspergillus oryzae*. (Landwirtschaftliche Jahrbücher, Berlin, 1910, Bd. 39, Ergänzungsband 3, p. 298-314.) **VPA (Prussia)**

Notes that the action of taka-diastrase is injured by alcohol and ether, and that ammonium sulphate is the only salt useful for its precipitation. Finds the nitrogen content has no relation to the activity of amylases; that they can not be separated by dialysis through parchment; small amounts of sugar have no effect but large amounts of maltose check their hydrolytic action; the optimum temperatures vary with the origin of the amylases.

Abstract in *Jour. soc. chem. ind.*, 1910, v. 29, p. 1073; *Chem. Zentr.*, Bd. 2, p. 398.

3292. Lindner, Paul, and O. Mohr. Die Vergärbarkeit von Säure-, Bier- und Würz-Dextrinen durch verschiedene Hefen und Schimmelpilze. (Wochenschrift für Brauerei, München, 1911, Jahrg. 28, p. 393-395.)

Available in Library of the Brewers' Academy.

The dextrins do not show marked differences in degree of fermentation.

Abstract in *Chem. abst.*, 1912, v. 6, p. 791; *Jour. soc. chem. ind.*, 1911, v. 30, p. 1131; *Chem. Zentr.*, 1911, Bd. 2, p. 1542.

3293. Scherer. Sur une petite distillerie à l'amylo. (Abstract.) (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1911-12, tome 29, p. 547.) **VOA**

Mucor delemar is used.

3294. Kita, Genitsu. Über die Enzyme des *Aspergillus oryzae*. (Wochenschrift für

Brauerei, Berlin, 1912, Jahrg. 29, p. 460-463.)

Available in Library of the Brewers' Academy.

Finds in all nutrient media investigated that *A. oryzae* secretes a diastatic enzyme, the quantity depending upon the nature of the nutrient medium and the age of the culture. The presence of acid is injurious to weak solutions of the enzyme but acts favorably when the enzyme is present in sufficient quantity. — *Chem. abst.*

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 833; *Chem. Zentr.*, 1912, Bd. 2, p. 1386; *Bull. assoc. chimistes*, 1912-13, tome 30, p. 372.

3295. Lindner, P. Die Assimilierbarkeit von Säure-, Bier- und Würzextrinen durch verschiedene Hefen und Schimmelpilze. (Wochenschrift für Brauerei, Berlin, 1912, Jahrg. 29, p. 541-544.)

Available in Library of the Brewers' Academy.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 1002; *Chem. Zentr.*, 1912, Bd. 2, p. 1683.

3296. Ortvad, N. C. Application of takakoji in distilleries. (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 26, p. 69-76.) **PKR**

Four per cent of taka-koji, prepared by growing *Aspergillus oryzae* on wheat bran, will completely convert a well prepared mash in 15 to 20 minutes. The market price is not susceptible to wide variations and is uniformly lower than that of malt.

Also in *Zeitschrift für Spiritusindustrie*, Berlin, 1914, Jahrg. 37, p. 20-21, † VTZA.

Abstract in *Jour. soc. chem. ind.*, 1913, v. 32, p. 708; *Chem. abst.*, 1913, v. 7, p. 1949; *Chem. Zentr.*, 1914, Bd. 1, p. 1312.

3297. Schmidt, Ch. Ed. Beiträge zur Kenntnis der Einwirkung von *Bacterium Coli* und von Darmbakterien auf Kohlenhydrate. (Auszug.) (Chemisches Zentralblatt, Berlin, 1912, Bd. 1, p. 43.) **PKA**

Under certain described conditions starch and dextrin are quantitatively fermented.

Abstract in *Chem. abst.*, 1912, v. 6, p. 500.

3298. Friedrichs, Oscar. Verhalten der Stärkedextrine gegen einige Hefearten. (Arkiv för kemi, mineralogi och geologi, Stockholm, 1913-15, bd. 5, no. 3, 14 p.) **PWA**

Investigates action of 10 different yeasts on dextrins prepared above. The specificity of the yeasts furnishes some indication of the presence of β glucoside linkages in starch and dextrin molecules.

Abstract in *Jour. chem. soc.*, 1914, v. 106, part 1, p. 146; *Jour. soc. chem. ind.*, 1914, v. 33, p. 328; *Chem. Zentr.*, 1914, Bd. 1, p. 762.

ases, continued.

ld, Fungus, Yeast and Bacterial Amylases, continued.

Heinrich, F. Über das Amylover-
en und die dabei verwendeten Organismen.
(Zeitschrift für Spiritusindustrie, Berlin, 1913, Jahrg. 36, p. 317-318.) †† VTZA
condensed in *Bull. assoc. chimistes*, 1913-14, tome
145-148.
Abstract in *Chem. abst.*, 1913, v. 7, p. 3388.

Hoffmann, Wilhelm. Die Verar-
ung von Kartoffelstärke zu technischer
ungsmilchsäure. (Zeitschrift für Spiritus-
industrie, Berlin, 1913, Jahrg. 36, p. 71-
95.) †† VTZA

The starch is saccharified by malt, the
h treated with chalk, diluted to a con-
centration of 10% maltose and inoculated
a culture of lactic acid bacillus. Fer-
mentation is complete in 6-8 days, the mix-
is then made slightly alkaline with
ed lime, the clear liquid drawn off, the
ium lactate decomposed by sulphuric
and the calcium sulphate removed by
ter press. Gives method for removal of
and further purification.

condensed in *Bull. assoc. chimistes*, 1912-13, tome
1. 760-762.
Abstract in *Chem. abst.*, 1913, v. 7, p. 2647; *Jour.
chem. ind.*, 1913, v. 32, p. 303; *Zeit. ang. Chem.*,
Jahrg. 26, Bd. 2, p. 371; *Wag. Jahr.*, 1913,
g. 59, Bd. 2, p. 363.

Kita, Genitsu. Some properties of
diastase. (Journal of industrial and en-
gineering chemistry, Easton, 1913, v. 5, p.
2-222.) VOA

Experiments indicate the presence of an
yme other than amylase or glucase.
ch produces glucose directly from starch.
estigates protective action of salts.

Abstract in *Jour. soc. chem. ind.*, 1913, v. 32, p.
Jour. chem. soc., 1913, v. 104, part 1, p. 410;
n. abst., 1913, v. 7, p. 3978; *Chem. Zentr.*, 1913,
1, p. 1711.

Grove, O. Amylo-process of fer-
mentation. (Institutes of Brewing, Journal,
ndon, 1914, v. 20, p. 248-261.)

Available in Library of the Chemists'

b.
discussion, p. 261-266.

of the organisms employed *Rhizopus del-*
ar is most satisfactory. The starch is
ified by HCl or malt, according to its
in, and a pure spore culture of the mould
roduced, followed by introduction of a
ure of yeast after 29 hours. Process is
d extensively in southern Europe.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p.

Rosenthal, Eugen, and JOSEPH A.
AI. Studien über die Produktion amylo-

lytischer und glykolytischer Bakterienfer-
mente. 1. (Centralblatt für Bakteriologie,
Jena, 1914, Abt. 1, Bd. 74, p. 369-373.) QDA

The curve of the production of amylolytic
enzymes by different strains of streptococci,
staphylococci, and *B. coli* rose gradually in
height and reached its maximum about the
9th or 10th day. The rate and amount of
production of the amylolytic enzymes by
virulent and avirulent strains of the organ-
isms showed no significant difference.—
Chem. abst.

Abstract in *Chem. Zentr.*, 1915, Bd. 1, p. 442.

3304. Söhngen, N. L. Invloed van eenige
kolloiden op mikro-biologische processen.
(Chemisch weekblad, Amsterdam, 1914,
jaarg. 11, p. 42-59.) †3-VOA

Notes influence of various colloids on the
hydrolysis of starch by *B. ochraceus*. The
enzyme developed by *B. ochraceus* is very
similar to malt amylase.

Abstract in *Chem. abst.*, 1914, v. 8, p. 357; *Chem.
Zentr.*, 1914, Bd. 1, p. 691.

3304A. Adersen, Vald. Die Spezifizität
des Drusestreptococcus, mit besonderer Be-
rücksichtigung des Vergärungsvermögens
gegenüber Kohlehydraten usw. (Central-
blatt für Bakteriologie und Parasitenkunde,
Jena, 1915, Abt. 1, Bd. 76, p. 111-117.) QDA

Starch is attacked with formation of acid.

Abstract in *Chem. Zentr.*, 1915, Bd. 2, p. 87.

3304B. Currie, James N., and CHARLES
THOM. An oxalic acid producing penicil-
lium. (Journal of biological chemistry, Bal-
timore, 1915, v. 22, p. 287-293.) PKA

A description and drawings of *Penicillium*
oxalicum is given. The organism produces
oxalic acid from starch and other carbo-
hydrates.

Abstract in *Chem. Zentr.*, 1915, Bd. 2, p. 1205.

3305. Makrinov, I. A. A new microorgan-
ism bringing about the fermentation of
starch and pectous materials. [Title trans-
lated.] (Archives des sciences biologiques,
St. Petersburg, 1915, tome 18, p. 413-425.)

*QCB

The organism *Pectinobacter amylophilum*
decomposes starch without the formation
of sugars, although there is some dextrin
formed. The main products are CO₂, H₂
and certain organic acids, formic and acetic
acids being chief among the latter.

Abstract in *Chem. abst.*, 1923, v. 17, p. 3686.

3306. Hutchinson, C. M., and C. S. RAMAY-
YAR. Bâkhar, the Indian rice beer ferment.

*Amylases, continued.**Mould, Fungus, Yeast and Bacterial Amylases, continued.*

(Abstract.) (Society of Chemical Industry, Journal, London, 1916, v. 35, p. 751.) **VOA**

Note that the ferment contains many varieties of mucor which saccharify starch.

Also abstracted in *Chem. abst.*, 1916, v. 10, p. 623.

3307. Koch, G. P. Diastase activity and invertase activity of bacteria. (Soil science, New Brunswick, N. J., 1916, v. 1, p. 179-196.) **PTK**

Abstract in *Chem. abst.*, 1916, v. 10, p. 1205.

3308. Effront, Jean. Achrodextrinase. (Académie des sciences, Comptes rendus, Paris, 1917, tome 164, p. 415-416.) ***EO**

The enzyme secreted by *B. mesentericus* converts starch and erythrodextrin to achrodextrin, but its saccharifying power is very restricted. This bacterial enzyme is precipitated by alcohol and ammonium sulphate, is markedly resistant to alkalis, and shows a maximum activity at 40°.

Abstract in *Jour. soc. chem. ind.*, 1917, v. 36, p. 468; *Chem. abst.*, 1917, v. 11, p. 1841; *Chem. Zentr.*, 1917, Bd. 2, p. 60.

3309. Horn, J. S. The amylo saccharification process. (Chemical engineer, New York, 1917-18, v. 26, p. 204-207, 236.) **PKA**

Discusses advantages and outlines procedure. The application of mould saccharification to the production of acetone is also dealt with.

Abstract in *Chem. abst.*, 1918, v. 12, p. 1811.

3310. Allen, Paul W. A simple method for the classification of bacteria as to diastase formation. (Journal of bacteriology, Baltimore, 1918, v. 3, p. 15-17.)

Available in Library of the New York Academy of Medicine.

Recommends the use of a medium obtained by adding 0.2% water-soluble starch to standard agar. Gives illustrations.

Abstract in *Chem. abst.*, 1918, v. 12, p. 709.

3311. Euler, Hans von. Enzymchemische Studien. (Zeitschrift für Elektrochemie und angewandte physikalische Chemie, Halle, 1918, Jahrg. 24, p. 173-177.) **PKA**

Quantitatively follows course of starch hydrolysis by the enzyme of *Mucor mucedo*.

Abstract in *Chem. Zentr.*, 1918, Bd. 2, p. 289.

3312. Kita, Genitsu. Über den Einfluss der Kalziumsalze auf das Stärke verflüssigende Enzym des *Aspergillus oryzae*. (Kyoto.—

Imperial University: College of Science and Engineering, 1918, v. 2, p. 1-5.) **VDA**

Addition of calcium salts increases the amylolytic activity of taka-diastase at 25° and 50° and of malt diastase at 50°. Although there is some retarding of saccharification, the presence of these salts is regarded as beneficial in Japanese brewing processes.

Also in *Kogyo-Kwagaku Zasshi* [Journal of chemical industry], Tokyo, 1917, v. 20, no. 231, p. 455-459.

Abstract in *Chem. abst.*, 1919, v. 13, p. 285; *Bull. soc. chim. France*, 1922, série 4, tome 32, p. 533.

3313. Bettinger, P., and DELAVAL. Action des différents acides sur le *Mucor végétal*. (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1919-20, année 37, p. 254-261.) **VOA**

In the use of mucors for saccharification of rice mash, find the mucors grow better if the starch has been previously saccharified by acids instead of by diastase. Investigate action of different acids at varying H ion concentrations.

Abstract in *Chem. abst.*, 1920, v. 14, p. 3120; *Jour. soc. chem. ind.*, 1920, v. 39, p. 555A.

3314. Bettinger, P. Sur l'alcool produit par les mucors pendant la guerre. (Association des chimistes, Bulletin, Paris, 1919-20, tome 37, p. 427-433.) **VOA**

General discussion, in which a number of statistical compilations are given.

3315. Delemar, A. Les nouveaux modes d'emploi des mucédinées dans les industries agricoles. (Chimie et industrie, Paris, 1919, v. 2, p. 892-898.) **VOA**

A historical review of the development of the use of diastase-secreting fungi, particularly *Amylomyces rouxii*, in the preparation of alcohol from cereals.

Abstract in *Jour. soc. chem. ind.*, 1919, v. 38, p. 874; *Chem. abst.*, 1920, v. 14, p. 447; *Chem. Zentr.*, 1920, Bd. 2, p. 87.

3316. Gill, Amos. The acetone fermentation process and its technical application. (Society of Chemical Industry, Journal, London, 1919, v. 38, p. 273-280T.) **VOA**

Discussion, p. 280-282T.

Abstract in *Chimie et industrie*, 1920, v. 3, p. 479.

3317. — The production of normal butyl alcohol and acetone by fermentation of horse-chestnuts. (Society of Chemical Industry, Journal, London, 1919, v. 38, p. 411-412T.) **VOA**

3318. Northrop, John H., and others. Biochemistry of *Bacillus acetoethylicum* with reference to the formation of acetone. By J. H. Northrop, Lauren H. Ashe and James

lases, continued.

ld, Fungus, Yeast and Bacterial Amylases, continued.

Senior. (Journal of biological chemistry, 1919, v. 39, p. 1-21.) **PPB**

he organism, which is similar to B. erans, ferments sugars and starch, the products being ethyl alcohol and ace-

bstract in *Chem. abst.*, 1919, v. 13, p. 2546; *Chem. Zentr.*, 1920, Bd. 3, p. 695.

J. Reilly, Joseph, and W. J. HICKINBOTTOM. Mechanism of the "n-butyl alcohol acetone" fermentation process. (Chemical trade journal and chemical engineer, London, 1919, v. 65, p. 331.) **†VOA**

bstract in *Chem. Zentr.*, 1920, Bd. 1, p. 112; *Chem. Zentr.*, 1920, v. 4, p. 475.

D. Speakman, Horace B. The production of acetone and butyl alcohol by a biological process. (Society of Chemical Industry, Journal, London, 1919, v. 38, p. 161T.) **VOA**

he industrial process is described in detail and 7 figures given.

bstract in *Chem. Zentr.*, 1919, Bd. 4, p. 737.

L. Tongs, M. S. Ectoenzymes of streptococci. (American Medical Association, Journal, Chicago, 1919, v. 73, p. 1277-1299.) **†WAA**

cludes a study of those streptococci which are capable of hydrolyzing starch.

bstract in *Chem. abst.*, 1921, v. 15, p. 3504.

2. Went, F. A. F. C. On the course of the formation of diastase by *Aspergillus niger*. (Akademie van Wetenschappen, Proceedings, Amsterdam, 1919, v. 21, p. 479-493.) ***EL**

The *Aspergillus niger* was grown in a pure solution containing glucose and small amounts of inorganic salts. The presence of amylase was determined by the length of time required for disappearance of the iodine reaction in a mixture of starch-enzyme solutions. The quantity of amylase reaches a maximum about 5 days after the commencement of germination.

bstract in *Chem. abst.*, 1919, v. 13, p. 1483; *Chem. soc. chem. ind.*, 1919, v. 38, p. 229A.

3. Arzberger, C. F., and others. Certain factors that influence acetone production by *Bacillus acetoethylcum*. By C. F. Arzberger, W. H. Peterson and E. F. Reid. (Journal of biological chemistry, Baltimore, 1920, v. 44, p. 465-479.) **PPB**

Bac. acetoethylcum ferments glucose, sucrose, potato starch, and xylose in a peptone-phosphate medium with the production

of acetic, formic, and lactic acids, ethyl alcohol, acetone, and carbondioxide. Potato starch medium when inoculated with *B. acetoethylcum* is first liquefied and then goes through a process of hydrolysis. No reducing sugars have been detected in a fermenting culture of this kind, although the possibility of their formation is not excluded.

3324. Avery, O. T., and GLENN E. CULLEN. Studies of the enzymes of pneumococcus. 3. Carbohydrate-splitting enzymes: invertase, amylase and inulase. (Journal of experimental medicine, New York, 1920, v. 32, p. 583-593.)

Available in Library of the New York Academy of Medicine.

Optimum activity of the amylase occurs at about pH 7. Activity is exhibited only after the cell has been disintegrated, indicating that the enzymes are not true secretory products of the living cell.

Abstract in *Chem. abst.*, 1921, v. 15, p. 544.

3325. Bettinger, P. Sur le tyrothrix de Kayser, ses propriétés et son emploi pratique dans les laboratoires et l'industrie. (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1920-21, tome 38, p. 463-471.) **VOA**

The organism develops marked amylolytic properties and its use in the manufacture of dextrin and as a desizing agent is suggested.

Abstract in *Chem. abst.*, 1922, v. 16, p. 1104.

3326. Chapman, A. Chaston. Micro-organisms and some of their industrial uses. (Brewer's journal, London, 1920, v. 46, p. 518-522; 1921, v. 57, p. 30-39.) **VTRA**

Includes a full discussion on the liquefaction and fermentation of starch.

Abstract in *Chem. Zentr.*, 1921, Bd. 2, p. 877.

3327. Euler, Hans von, and S. ASARNOJ. Zur Kenntnis der Enzymbildung bei *Aspergillus niger*. (Fermentforschung, Leipzig, 1920, Bd. 3, p. 318-329.) **PPH**

The formation of amylase by *Aspergillus niger* was followed. Sugars formed by the enzyme were estimated by method of Bertrand, Wohlgemuth's method not being well adapted to this determination.

Abstract in *Chem. abst.*, 1921, v. 15, p. 1538; *Chem. Zentr.*, 1920, Bd. 3, p. 201.

3328. Reilly, Joseph, and others. Products of the "acetone: butyl alcohol" fermentation of carbohydrate material with special reference to some of the intermediate substances produced. By Joseph Reilly, W. J. Hickinbottom, F. R. Henley, and A. C.

*Amylases, continued.**Mould, Fungus, Yeast and Bacterial Amylases, continued.*

Thaysen. (Biochemical journal, Cambridge, 1920, v. 14, p. 228-251.) **PPB**

Starch and maize were used as raw materials. Note that the ratio of butyric to acetic acid increases with an increase in the acidity of the mash. An increased yield of acetone was obtained by the addition of ethyl acetoacetate.

Abstract in *Chem. Zentr.*, 1920, Bd. 3, p. 376; *Chem. abst.*, 1920, v. 14, p. 2048.

3329. Speakman, Horace B. Biochemistry of the acetone and butyl alcohol fermentation of starch by *Bacillus granulobacter pectinovorum*. (Journal of biological chemistry, Baltimore, 1920, v. 41, p. 319-343.) **PPB**

Bacillus granulobacter pectinovorum growing in a medium rich in starch changes the latter into dextrose by exoenzymic activity. The dextrose then passes into the cell, and is oxidized to acetic and butyric acids, which are reduced in part to the corresponding alcohols.

Abstract in *Chem. abst.*, 1920, v. 14, p. 3437.

3330. — Production of gas during the acetone and butyl alcohol fermentation of starch. (Journal of biological chemistry, Baltimore, 1920, v. 43, p. 401-411.) **PPB**

From a study of the production of gas during this fermentation, a scheme is suggested to account for the substances formed which is believed to be in harmony with experimental observations, the requirements of the organism, and the conditions during fermentation.

Abstract in *Chem. abst.*, 1920, v. 14, p. 3692; *Chem. Zentr.*, 1921, Bd. 1, p. 38; *Chimie et industrie*, 1921, v. 6, p. 171.

3331. Takamine, Jokichi, jr., and KOKICHI OSHIMA. The properties of a specially prepared enzymic extract, polyzime, comparing its starch liquefying power with malt diastase. (American Chemical Society, Journal, Easton, 1920, v. 42, p. 1261-1265.) **PKA**

The commercial preparation polyzime is an enzymic extract of *Aspergillus oryzae*. Authors determine general properties of the preparation, compare amyloclastic activity with that of malt diastase, determine optimum reaction of starch solution, and also optimum temperature of liquefaction. Have selected the Wohlgemuth method for determination of amyloclastic activity which they describe in detail.

Abstract in *Jour. chem. soc.*, 1920, v. 118, part 1, p. 574; *Chem. Zentr.*, 1920, Bd. 3, p. 388; *Chimie et industrie*, 1921, v. 5, p. 158; *Bull. soc. chim. France*, 1920, série 4, tome 28, p. 699.

3332. Enzyme activity as influenced by hydrogen-ion concentration with special reference to the koji enzymes. (Abstract.) (Chemical abstracts, Easton, 1921, v. 18, p. 868.) **PKA**

Notes that optimum activity of the amylase occurs at pH 4.85.

3333. Epstein, Albert A. *Pseudomonas polysaccharidarum*: an organism which decomposes complex polysaccharides. (Abstract.) (Chemical abstracts, Easton, 1921, v. 15, p. 2653.) **PKA**

The new species decomposes starch.

Also abstracted in *Jour. soc. chem. ind.*, 1921, v. 40, p. 234A; *Chem. Zentr.*, 1921, Bd. 1, p. 224.

3334. Harter, L. L. Amylase of *Rhizopus tritici*, with a consideration of its secretion and action. (Journal of agricultural research, Washington, 1921, v. 20, p. 761-786.) **VPZ (U. S. Agriculture)**

A full investigation of the factors influencing production of the enzyme. The optimum temperature for digestion of starch is 45°. Digestion is carried to the achromic point but does not go to completion.

Abstract in *Chem. abst.*, 1921, v. 15, p. 1320; *Chem. Zentr.*, 1921, Bd. 3, p. 348.

3335. Javillier, M. Les réactifs biologiques en chimie. (Société chimique de France, Bulletin, Paris, 1921, série 4, tome 29, p. 1037-1052.) **PKA**

Includes general review on the production of acetone from starch by fermentation.

3336. Karrer, Joanne L. Studies in the physiology of the fungi. 13. The effect of hydrogen-ion concentration upon the accumulation and activation of amylase produced by certain fungi. (Missouri Botanical Garden, Annals, St. Louis, 1921, v. 8, p. 63-96.)

Available in Library of Columbia University.

The experiments are given in detail and illustrated by diagrams.

Abstract in *Chem. abst.*, 1922, v. 16, p. 3680.

3337. Sjöberg, Knut. Enzymatische Untersuchungen an einigen Grünalgen. (Fermentforschung, Leipzig, 1921, Bd. 4, p. 97-141.) **PPH**

Notes that when certain algae are grown in a nutrient media of sugar solutions the proportion of amylase diminishes, whereas the amount of amylase increases in culture solutions containing starch, calcium tartrate or calcium lactate. The amylase of *Cladophora glomerata* exhibits optimum activity at pH 4-5. Other conditions affecting the

glases, continued.

ld, *Fungus, Yeast and Bacterial Amylases, continued.*

nation and activity of amylase are investigated.

Abstract in *Chem. abst.*, 1921, v. 15, p. 2645; *Ch. Zentr.*, 1921, Bd. 1, p. 153.

8. **Thaysen, A. C.** Bacteriology of the process for acetone and n-butyl alcohol manufacture. (Institutes of Brewing, Journal, London, 1921, v. 27, p. 529-542.) **VTRA**

gives details and industrial preparation of Globobacter. The bacillus produces diastatic and proteolytic enzymes. Fermentation of maize mash produces about 12 parts acetone and 24 parts butyl alcohol per 100 parts starch decomposed.

Abstract in *Chem. abst.*, 1922, v. 16, p. 3362.

9. **Euler, Hans von, and O. SVANBERG.** Einige Versuche über die Aciditätsbedingungen des Zuwachses von Bacillus maceus und über den Verlauf der Stärkespaltung. (Biochemische Zeitschrift, Berlin, 1922, Bd. 128, p. 323-325.) **PPB**

On potato starch cultures find optimum growth at about pH 6.8. Find starch is most quantitatively converted to amyloses. Abstract in *Chem. abst.*, 1922, v. 16, p. 1967; *Ch. Zentr.*, 1922, Bd. 3, p. 66.

10. **Robinson, Guy C.** A study of the acetone and butyl alcohol fermentation of various carbohydrates. (Journal of biological chemistry, Baltimore, 1922, v. 53, p. 125-130.) **PPB**

Using 17 different carbohydrates, follows course of fermentative action of organisms of the Granulobacter type. With a gelatinous potato starch mash, liquefaction and fermentation commenced very soon after inoculation. Dextrins hydrolyzed by malt amylase and by acid show marked differences in the course of their fermentations. Abstract in *Chem. abst.*, 1922, v. 16, p. 3496; *Ch. Zentr.*, 1922, Bd. 3, p. 1382; *Bull. soc. chim. France*, 1922, série 4, tome 32, p. 1953.

11. **Davis, Arthur L.** Acetone, butanol, and ethanol in gas from the butyric fermentation of corn. (Industrial and engineering chemistry, Easton, 1923, v. 15, p. 631-634.) **VOA**

Deals with use of activated carbon as a method of analysis and recovery of the solvents by absorption with cresol.

12. **Effront, Jean.** L'évolution des inerties de la fermentation sous l'influence des théories de Pasteur. (Chimie et industrie, Paris, 1923, v. 9, p. 1076-1093.) **VOA**
includes discussion on the amylo process and industrial application of bacterial amylases.

3343. **Galle, Ernst.** Das Amyloverfahren und seine Anwendungsmöglichkeiten. (Zeitschrift für angewandte Chemie, Leipzig, 1923, Jahrg. 36, p. 17-19.) **PKA**

Reviews literature on fermentation of starch by *Amylomyces rouxii*. Describes in detail production of alcohol in a maize distillery. A yield of 30-40 liters per 100 kg. dry maize is obtained in practice.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 156A; *Chem. Zentr.*, 1923, Bd. 2, p. 583.

3343A. **Lumn, A. H., and HERBERT LANGWELL.** Action of bacteria on cellulosic materials. (Society of Chemical Industry, Journal, London, 1923, v. 42, p. 280-283T.) **VOA**

The bacillus described also effects the fermentation of starch.

3344. **Mangin, L.** Transformation directe des matières amylacées en vinaigre. (Académie d'agriculture de France, Comptes rendus, Paris, 1923, tome 9, p. 134-136.)

Available in Library of the Department of Agriculture.

Abstract in *Chem. abst.*, 1923, v. 16, p. 1685.

3345. **Oshima, Kokichi, and MARGARET B. CHURCH.** Industrial mold enzymes. (Industrial and engineering chemistry, Easton, 1923, v. 15, p. 67-70.) **VOA**

Using wheat bran as a culture medium, determine amounts of protease and amylase produced by a number of strains of the *Aspergillus flavus-oryzae* group. A number of natural food substances are tested for their value as culture media.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 238A; *Chem. Zentr.*, 1923, Bd. 4, p. 434; *Chimie et industrie*, 1924, v. 11, p. 755; *Bull. soc. chim. France*, 1923, série 4, tome 34, p. 1111.

3346. **Harter, L. L.** Amylase in the spores of *Rhizopus tritici* and *Rhizopus nigricans*. (American journal of botany, Lancaster, 1925, v. 10, p. 89-92.) **QEA**

An enzyme is produced in the spores of *R. tritici* and *R. nigricans* capable of hydrolyzing Irish potato starch paste to reducing sugars. The enzyme is produced at temperatures at which spores are produced. — *Chem. abst.*

3346A. **Nishiwaki, Y.** Die optimale Temperatur für das Wachstum und die Diastasebildung des *Aspergillus oryzae*. (Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, Jena, 1925, Abt. 2, Bd. 63, p. 102-106.) **QDA**

The optimum temperature for growth and production of diastase is 35.5 to 34.5°, the minimum 7° to 9° and the maximum 45° to 47°.

Amylases, continued.

Mould, Fungus, Yeast and Bacterial Amylases, continued.

3347. Schmidt, Dorothea. Über die Pilzstärke (Amylose) bei *Aspergillus niger* v. Tgh. und einige Bemerkungen über ihren diastatischen Abbau. (Biochemische Zeitschrift, Berlin, 1925, Bd. 158, p. 223-252.)

PKA

Abstract in *Chem. abst.*, 1925, Bd. 19, p. 3282; *Chem. Zentr.*, 1925, Bd. 2, p. 1177.

3348. Siedich, A. S. Two new microbes which decompose starch. (Abstract.)

(Chemical abstracts, Easton, 1925, v. 19, p. 2683.)

PKA

Claims to have isolated 2 microbes from the soil: one a spore-forming rod, and the other a coccus. The former decomposes starch to dextrin and no further, the other up to the sugars, which are utilized and decomposed after all the starch has been used. These organisms do not decompose cellulose. The first form does not develop on alcohol, glycerol or mannitol.

3349. Staiger, and W. GLAUBITZ. Gibt es Dextrin vergärende Heferassen? (Zeitschrift für Spiritusindustrie, Berlin, 1925, Jahrg. 48, p. 320-321.) **†† VTZA**

Abstract in *Chem. abst.*, 1926, v. 20, p. 61; *Chem. Zentr.*, 1925, Bd. 2, p. 1395.

SOURCES AND OCCURRENCE OF AMYLASES

3350. Leuchs, E. F. Wirkung des Speichels auf Stärke. (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1831, Bd. 22, p. 623.) **PAA**

Finds ptyalin converts cooked starch into a sweet material.

3351. Bouchardat, G., and SANDRAS. Des fonctions du pancréas et de son influence dans la digestion des féculeux. (Académie des sciences, Comptes rendus, Paris, 1845, tome 20, p. 1085-1091.) ***EO**

3352. Busch, W. Beitrag zur Physiologie der Verdauungsorgane. (Archiv für pathologische Anatomie und Physiologie, Virchow's, Berlin, 1858, Bd. 14, p. 140-186.)

Available in Library of the New York Academy of Medicine.

Notes the presence of an amylolytic enzyme in the small intestine.

3353. Mège-Mouriès. Action des tissus du son de froment sur l'amidon. (Académie des sciences, Comptes rendus, Paris, 1859, tome 48, p. 431-434.) ***EO**

Notes the presence of a substance termed "cerealine" in the wheat bran which is capable of transforming starch into sugar and a dextrin.

3354. Danilewski. Über specifisch wirkende Körper des natürlichen und künstlichen pancreatischen Saftes. (Archiv für pathologische Anatomie und Physiologie, Virchow's, Berlin, 1862, Bd. 25, p. 279-307.)

Available in Library of the New York Academy of Medicine.

Isolated a soluble amylolytic enzyme from the pancreas by acidifying the aqueous infusion with phosphoric acid and precipitating with lime.

3355. Leuchs, G. Ueberführung der Stärke in Zucker durch die Schalen roher Kartoffeln. (Journal für praktische Chemie, 1864, Leipzig, Bd. 92, p. 59.) **PKA**

Dilute starch paste was digested at 45-50° with a relatively large weight of potato skins. After 10-12 hours the starch was almost completely transformed to sugar. Ungelatinized starch was not affected by a similar treatment.

Abstract in *Jahresber. Chem.*, 1864, p. 571.

3356. Urban, Anton. Ueber die Vertheilung der Diastase im Malz. (Bayerische Bierbrauer, München, 1871, Jahrg. 6, p. 162-170.)

Available in Library of the Patent Office.

Duplicate summaries in *Chem. Centr.*, 1872, p. 332-333; *Wag. Jahr.*, 1872, Jahrg. 18, p. 559-561.

3357. Huefner, G. Untersuchungen über "ungeformte Fermente" und ihre Wirkungen. 1. (Journal für praktische Chemie, Leipzig, 1872, N. F., Bd. 5, p. 372-396.) **PKA**

Notes the transformation of starch into sugar by the glycerin extract of pancreas.

3358. Erlenmeyer, E., and A. v. PLANTA. Ueber die Fermente in den Bienen, im Bienenbrod und im Pollen und über einige Bestandtheile des Honigs. (Königlich Bayerische Akademie der Wissenschaften, Sitzungsberichte, München, 1874, Bd. 4, p. 204-207.) ***EE**

Notes the presence of amylase.

Abstract in *Chem. Centr.*, 1874, p. 790.

3359. Kosmann, C. Recherches chimiques sur les ferments contenus dans les végétaux, et sur les effets produits par l'oxydation du fer sur les matières organiques.

ases, continued.

es and Occurrence of Amylases, cont'd.

été chimique de Paris, Bulletin, 1877, série, tome 27, semestre 1, p. 251-

PKA

tes the presence of amylase in a large
ber of plants. Places a starch suspen-
in contact with strips of Fe and notes
oxidation of the Fe is accompanied by
ation of sugar.

Mering, von, and FRITZ MUSCULUS.
r die Einwirkung von Speichel- und
reasferment auf Glykogen und Stärke.
tschrift für physiologische Chemie,
oe-Seyler's, Strassburg, 1877-78, Bd. 1,
5.)

PKA

nd that ptyalin and pancreatic amylases
ert starch to maltose.

Krauch, C. Beiträge zur Kenntniss
ungeformten Fermente im Pflanzen-
. (Landwirtschaftlichen Versuchs-
tionen, Berlin, 1879, Bd. 23, p. 77-104.)
Available in Library of the Department
griculture.

r extractions with dilute salicylic acid
with glycerin, determines relative
unts of diastase in various plants. Gives
ysis of malt diastase.

stract in *Jour. chem. soc.*, 1878, v. 34, p. 996-
Chem. Centr., 1878, p. 597.

Béchamp, Auguste. Des microzymas
iques et de leur pouvoir digestif.
adémie des sciences, Comptes rendus,
s, 1882, tome 94, p. 582-585.) ***EO**
ertain of the preparations dissolve but
ot saccharify starch.

stract in *Jahresber. Chem.*, 1882, p. 1245.

Lintner, Carl J. Eine Studie über
werthbestimmenden Eigenschaften der
kstoffhaltigen Bestandtheile der Gerste
des Malzes. (Zeitschrift für Spiritusin-
rie, Berlin, 1883, N. F., Jahrg. 6, p. 997-
.)

Available in Library of the Patent Office.
mples of malt extract containing vary-
amounts of nitrogenous materials are
d for starch-hydrolyzing ability.

stract in *Jour. soc. chem. ind.*, 1884, v. 3, p.

Brasse, L. Sur la présence de l'amy-
dans les feuilles. (Académie des sci-
s, Comptes rendus, Paris, 1884, tome
s, 878-879.) ***EO**

nylase was found in all leaves exam-

stract in *Jour. chem. soc.*, 1885, v. 48, p. 182;
Chem. Centr., 1885, p. 23.

3365. Breusing, R. Über das "stärkeum-
wandelnde" Ferment im menschlichen
Harn. (Archiv für pathologische Anatomie
und Physiologie, Virchow's, Berlin, 1887,
Bd. 107, p. 186-191.)

Available in Library of the New York
Academy of Medicine.

Abstract in *Chem. Centr.*, 1887, p. 163.

3366. Windisch, W. Ueber das diastatische
Ferment des ungekeimten Weizens.
(Wochenschrift für Brauerei, Berlin, 1888,
Jahrg. 5, p. 1038.)

Available in Library of the Brewers'
Academy.

Wheat contains an enzyme which con-
verts starch into maltose but does not
liquefy starch paste.

Abstract in *Jour. soc. chem. ind.*, 1889, v. 8, p.
560.

3367. Kaufmann, d'Alfort. Contribution à
l'étude de ferment glycosique du foie. (So-
ciété de biologie, Comptes rendus, Paris,
1889, année 41, p. 600-603.)

Available in Library of the New York
Academy of Medicine.

Notes that the gall of swine, sheep and
oxen exhibit a strong saccharifying action
on starch paste; whereas the action of cat
gall is very small and that of the dog is
almost nil.

Abstract in *Chem. Centr.*, 1890, Bd. 1, p. 596.

**3368. Brown, Horace T., and G. HARRIS
MORRIS.** Researches on the germination of
some of the gramineae. Part 1. (Chemical
Society of London, Journal, 1890, v. 57, p.
458-528.)

PKA

1. Introduction. 2. Structure of a grain
of barley. 6. The starch-containing portion
of the endosperm to be regarded as a store-
house of dead reserve material; no residue
of vitality being recognizable in its cells.
9. Growth of excised embryos on starch, and
proof that an amylo-hydrolyst (diastase) is
secreted by the growing embryo. 10. The
secretion of diastase is localized in the
"absorptive epithelium." 11. The secretion
of diastase increased by very dilute acid.
12. The secretion of diastase not stimulated
by the presence of starch. 13. The secre-
tion of diastase is inhibited by a readily
assimilable carbohydrate. 16. The two va-
rieties of diastase, their genesis, and dis-
tribution in the resting and germinating
seed. 17. Distribution of diastase in the
germinating seed. 18. The mother sub-
stance of "diastase of secretion" is prin-
cipally derived from the endosperm. 19.
Action of "diastase of secretion" upon un-
gelatinized starch. 20. A consideration of

Amylases, continued.

Sources and Occurrence of Amylases, cont'd.
the origin of the hydrolytic enzymes of germinating grain.

Abstract in *Jour. soc. chem. ind.*, 1890, v. 9, p. 530.

3369. Reinitzer, Friedrich. Ueber die wahre Natur des Gummiferments. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Strassburg, 1890, Bd. 14, p. 453-470.) **PKA**

The enzyme found in various species of gum is capable of converting starch to sugar.

Abstract in *Jour. chem. soc.*, 1890, v. 58, p. 998; *Jahresber. Chem.*, 1890, p. 2355.

3370. Wortmann, Julius. Ueber den Nachweis, das Vorkommen und die Bedeutung des diastatischen Enzyms in den Pflanzen. (Botanische Zeitung, Leipzig, 1890, Jahrg. 48, p. 581-594, 597-607, 617-627, 633-654, 657-669.) **QCA**

Abstract in *Chem. Centr.*, 1890, Bd. 2, p. 821-823; *ibid.*, 1892, Bd. 1, p. 632; *Centralblatt für Bakteriologie und Parasitenkunde*, 1892, Bd. 11, p. 370-373; *Jour. chem. soc.*, 1891, v. 60, p. 856.

3371. Moritz, E. R. Ueber die diastatische Kraft der Vorderwürzen. (Wochenschrift für Brauerei, Berlin, 1891, Jahrg. 7, p. 32-33.)

Available in Library of the Brewers' Academy.

Abstract in *Wag. Jahr.*, 1891, Jahrg. 37, p. 970.

3372. O'Sullivan, Cornelius. Researches on the gums of the arabin group. 2. Geddac acids, Gedda gums; the dextrorotatory varieties. (Chemical Society of London, Journal, 1891, v. 59, p. 1029-1075.) **PKA**

On p. 1061 notes that a sample of Gedda gum exhibits amyolytic activity.

3373. Bial, Manfred. Ueber die diastatische Wirkung des Blut- und Lymphserums. (Archiv für die gesamte Physiologie des Menschen und der Tiere, Pflüger's, Bonn, 1892, Bd. 52, p. 137-156.) **QCA**

3374. Brown, Horace T., and G. HARRIS MORRIS. On certain functions of hops used in the dry-hopping of beers. (Institute of Brewing, Transactions, London, v. 6, 1892-93, p. 94-106.)

Available in Library of the Patent Office.

Find that hops contain appreciable quantities of diastase which cannot be extracted by water because of tannin present.

Abstract in *Jour. soc. chem. ind.*, 1893, v. 12, p. 368.

3375. Roehmann, F. Zur Kenntniss des diastatischen Ferments der Lymphe. (Archiv für die gesammte Physiologie, Pflüger's, Bonn, 1892, Bd. 52, p. 157-164.) **QCA**

3376. Bial, Manfred. Das diastatische Ferment des Blutes. (Archiv für die gesammte Physiologie, Pflüger's, Bonn, 1893, Bd. 53, p. 156-170.) **QCA**

Abstract in *Jour. chem. soc.*, 1893, Bd. 2, p. 581; *Chem. Centr.*, 1892, Bd. 2, p. 1021.

3377. Brown, Horace T., and G. HARRIS MORRIS. A contribution to the chemistry and physiology of foliage leaves. (Chemical Society of London, Journal, 1893, v. 63, p. 604-677.) **PKA**

Part 1. The starch and diastase of leaves. 1. Introduction. 2. Historical. 3. The starch of the leaf, its determination, and the proportion it bears to the total products of assimilation. 4. The occurrence of diastase in the leaf. 5. What is the nature of the products of transformation of starch by leaf-diastase? 6. Determination of the diastatic activity of leaves. 7. Periodic variation of the diastase of leaves. 8. Can leaf-diastase act on solid starch? 9. How far is the disappearance of leaf-starch due to living protoplasm?

Part 2. The sugars of the leaf. 10. Historical. 11. The sugars of *Tropaeolum majus*. 12. Bibliography.

3378. Gonnermann, M. Ein diastatisches Ferment in der Zuckerrübe. (Chemiker-Zeitung, Cöthen, 1895, Jahrg. 19, p. 1806-1807.) **†† VOA**

Amylase is obtained from the aqueous extract of sugar beets by precipitating lead or calcium carbonate in the extract, acidifying the precipitate, reprecipitating with alcohol and extracting the precipitate with glycerol.

Abstract in *Jour. chem. soc.*, 1896, v. 70, part 2, p. 381; *Chem. Centr.*, 1895, Bd. 2, p. 1048.

3379. Arachequesne, G. Sur l'hypothèse d'une diastase saccharogénique dans la betterave. (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1896-97, tome 14, p. 670-673.) **VOA**

Referring to entry 3380 shows that Pasteur had demonstrated the presence of such a diastase.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 26, p. 342.

3380. Barbet, E. Sur l'hypothèse d'une diastase saccharogénique dans la betterave. (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1896-97, tome 14, p. 582-587.) **VOA**

Abstract in *Jour. soc. chem. ind.*, 1897, v. 26, p. 252.

ases, continued.

ces and Occurrence of Amylases, cont'd.

Fischer, Emil, and W. NIEBEL. Über Verhalten der Polysaccharide gegen tierische Sekrete und Organe. (Königlich Preussische Akademie der Wissenschaften, Sitzungsberichte, Berlin, 1896, p. 2.) *EE

ote conversion of starch to dextrose by secretions of different animals.

Abstract in *Jour. chem. soc.*, 1896, v. 70, part 2, 673; *Chem. Centr.*, 1896, Bd. 1, p. 499-501.

Takamine, Jokichi. Diastatic bodies in cereals, and their utilisation. (Society of Chemical Industry, Journal, London, 1898, p. 120-123.) VOA

Discussion, p. 121-123.

vidence that ungerminated cereals contain amylases. These amylases show only diastatic activity but considerable amylolytic activity.

Abstract in *Chem. Centr.*, 1898, Bd. 1, p. 994.

Lange, H. Woran erkennt man ein kräftiges Malz? (Zeitschrift für Brauereiindustrie, Berlin, 1899, N. F., Jahrg. 1, p. 403-404.)

Available in Library of the Patent Office. Results have shown that the light, small, nitrogenous varieties of barley are better adapted for yielding a highly diastatic malt than the heavy, full, brewing barleys.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 1183.

Mueller, Johannes, and M. MASUDA. Über ein diastatisches Ferment in der Brauerei. (Zeitschrift für Biologie, München und Leipzig, 1900, Bd. 39, p. 547-559.) QAA

The yolk of hen's eggs contains an enzyme which converts starch into dextrins and sugar.

Lindet, Léon. Sur l'action saccharifiante des germes de blé et sur l'emploi de ces germes en distillerie. (Académie des sciences, Comptes rendus, Paris, 1901, tome 2, p. 261-263.) *EO

Notes the presence of a diastase in "emmer bran," which has the saccharifying properties of malt and very probably the liquefying properties of malt. Because of its low cost, suggests that it may be used to replace barley malt in the distillery. Also printed in *Bull. assoc. chim.*, 1900-01, tome 2, p. 686-688.

Abstract in *Jour. soc. chem. ind.*, 1901, v. 20, p. 1183.

Pollak, Alfred. Die stärkeabbauenden Enzyme im Grünmalze. (Wochenschrift

für Brauerei, Berlin, 1904, Jahrg. 21, p. 317-319.) †VTRA

Average samples of germinating barley were taken daily throughout the period of malting and the acidity, starch-liquefying power and saccharifying power of the samples were determined. The results are illustrated by means of curves, showing the values from day to day.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 673; *Chem. Centr.*, 1904, Bd. 2, p. 376.

3387. Teichek, R. F. von. Studien über die Verteilung der diastatischen Enzyme des Grünmalzes. (Chemische Industrie, Berlin, 1904, Jahrg. 27, p. 270-275.) 3-VOA

Determines ratio of amylolytic to saccharogenic activity during various stages of malting. Gives elementary analysis of active preparations obtained. Results favor the 2 enzyme theory.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 673; *Chem. Centr.*, 1904, Bd. 2, p. 375.

3388. Zaitschek, A. Vergleichende Untersuchungen über den Gehalt an eiweiss- und stärkelösenden Enzymen verschiedener Milcharten. (Archiv für das gesammte Physiologie, Pflüger's, Bonn, 1904, Bd. 104, p. 539-549.) QCA

Fairly large quantities of amylase were found in all milks examined.

Abstract in *Chem. Centr.*, 1904, Bd. 2, p. 1244.

3389. Effront, Jean. Sur le développement de l'amylase pendant la germination des grains. (Académie des sciences, Comptes rendus, Paris, 1905, tome 141, p. 626-628.) *EO

During the germination of barley the saccharifying power reaches a maximum after the twenty-third day and then decreases; the liquefying power reaches a maximum after the twenty-seventh day and remains constant.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 1183; *Jour. chem. soc.*, 1906, v. 90, part 2, p. 116; *Chem. Centr.*, 1905, Bd. 2, p. 1505; *Bull. assoc. chimistes*, 1905-06, tome 23, p. 592.

3390. — Contribution à l'étude de la germination des grains. (Association des chimistes, Bulletin, Paris, 1905-06, tome 23, p. 508-522.) PKA

During germination of barley the amylolytic and saccharogenic activities develop independently of each other and are affected differently by sunlight and by chemical reagents.

Reprinted in *Moniteur scientifique du docteur Quesneville*, 1906, série 4, tome 20, partie 1, p. 5-15, O.A.

Abstract in *Chem. Centr.*, 1906, Bd. 1, p. 509.

*Amylases, continued.**Sources and Occurrence of Amylases, cont'd.*

3391. Ellrodt, G. Unterschied des Diastasegehalts von Malzen aus grosskörnigen und kleinkörnigen Gersten. (Wochenschrift für Brauerei, Berlin, 1906, Jahrg. 23, p. 243-244.) **VTRA**

Small corned malts are far richer in diastase than large ones.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 601; *Chem. Centr.*, 1906, Bd. 2, p. 177.

3392. Saiki, Tadasu. Über die enzymatische Wirkung des Rettigs (*Raphanus sativus* L.). (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Strassburg, 1906, Bd. 48, p. 469-472.) **PKA**

Determines amount of amylase in radishes.

Abstract in *Jour. chem. soc.*, 1906, v. 90, part 2, p. 796; *Chem. Centr.*, 1906, Bd. 2, p. 1275.

3393. Tanaka, Yoshio. Application of diastases present in unmalted cereals to the preparation of alcohol and "amé." (Tokio. — Imperial University: College of Engineering, Journal, 1906-09, v. 4, p. 205-217.) **VDA**

Combines infusions of wheat bran and of millet, which because of their saccharifying and liquefying powers respectively, furnish an economical substitute for malt. The combination is applied successfully to the production of "amé" from rice and of alcohol from rice and potatoes.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. 376; *Chem. abst.*, 1910, v. 4, p. 640; *Chem. Zentr.*, 1909, Bd. 1, p. 1949.

3394. Mendel, L. B., and F. P. UNDERHILL. Is the saliva of the dog amylolytically active? (Journal of biological chemistry, New York, 1907, v. 3, p. 135-143.) **PPB**

Conclude from their experiments that there is no evidence of any marked or characteristic digestive action upon starch paste.

3395. Windisch, W., and WILHELM JETTER. Über die Verbreitung der Diastase in den stärkemehlhaltigen Rohstoffen der Branntweinbrennerei. (Herstellung von Branntwein aus stärkemehlhaltigen Rohstoffen ohne Verwendung von Malz.) (Zeitschrift für Spiritusindustrie, Berlin, 1907, Jahrg. 30, p. 541-542, 552-555.) **†† VTZA**

Diastase content decreases in the following order: rye, wheat, barley, oats, corn, rice, and potatoes. Rye contains enough diastase to completely saccharify its raw starch.

Condensed in *Bull. assoc. chimistes*, 1907-08, tome 25, p. 804-806.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 84; *Chem. abst.*, 1908, v. 2, p. 686; *Chem. Zentr.*, 1908, Bd. 1, p. 535.

3396. Albo, G. Les enzymes et la faculté germinative des graines. (Archives des sciences physiques et naturelles, Genève, 1906, tome 25, p. 45-52.) **C**

Finds germinating power is proportionate to amount of amylase, and that they are equally affected by temperature, light and chemical reagents.

Abstract in *Chem. Zentr.*, 1908, Bd. 1, p. 869.

3397. Bialosuknia, W. W. Über Pflanzengermente. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Strassburg, 1909, Bd. 58, p. 487-499.) **PK**

Seeds of various plants were examined for proteolytic, oxidizing and amylolytic enzymes. All seeds examined showed amylolytic properties in varying degrees, some amylases producing galactose from starch while the amylase of ungerminated rice produced a mixture of lactose and glucose.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. 321; *Chem. abst.*, 1909, v. 3, p. 1994; *Jour. chem. soc.*, 1909, v. 96, part 2, p. 337; *Chem. Zentr.*, 1909, Bd. 1, p. 1023.

3398. Carlson, A. J., and J. G. RYAN. The diastase in cat's saliva. (American journal of physiology, Boston, 1908, v. 22, p. 1-15.) **QC**

Abstract in *Chem. Zentr.*, 1908, Bd. 2, p. 718.

3399. Euler, Hans von, and B. AF UGGLA. Untersuchungen über die chemische Zusammensetzung und Bildung der Enzyme. (Archiv för kemi, mineralogi och geologi, Uppsala and Stockholm, 1908-10, bd. 3, no. 30 and 34.) **PW**

Barley, which had been germinated in N/10 solution of disodium phosphate, exhibited an amylolytic activity 2.3 times greater than barley which had germinated in water. Further note that erythrodestrin may be removed from dextrin solution by filtration through animal charcoal.

Abstract in *Chem. Zentr.*, 1910, Bd. 2, p. 1550.

3400. Glimm, E. Verhältnis der Diastase zur Zuckermenge bei der Keimung der Gerste. (Zeitschrift für das gesamte Brauwesen, München and Berlin, 1908, Jahrg. 31, p. 439-442.) **† VTR**

Abstract in *Bull. assoc. chimistes*, 1908-09, tome 26, p. 1224-1225; *Chem. Zentr.*, 1908, Bd. 2, p. 131.

3401. Jalowetz, Ed. Zur Kenntnis der Enzyme der ungekeimten Gerste. (Wochenschrift für Brauerei, Berlin, 1908, Jahrg. 31, p. 557-559.) **† VTR**

Confirms earlier observations that the diastatic enzyme is localized mainly in the embryo end of the barley corn and that it possesses the power of dissolving and paraccharifying starch paste.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 1077; *Chem. abst.*, 1908, v. 2, p. 1851.

Amylases, continued.

Sources and Occurrence of Amylases, cont'd.

3402. **Liebig, H. J. von.** Über den Zucker-gehalt der feinen Weizenmehle, der Weizenmehlteige und der vergorenen Mehlteige, sowie über die diastatische Kraft der Weizenmehle. (Landwirtschaftliche Jahrbücher, Berlin, 1909, Bd. 38, p. 251-271.)

VPA (Prussia)

Notes that the saccharifying power of coarse wheat meal is about one-third that of the average kiln dried malt, while the liquefying power is comparatively insignificant.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. 488; *Chem. abst.*, 1909, v. 3, p. 2327; *Chem. Zentr.*, 1909, Bd. 1, p. 1256.

3403. **Ling, Arthur R., and others.** The production of diastase during the germination of barley on the malting floors. By A. R. Ling, Theodore Rendle, and George McLaren. (International Congress of Applied Chemistry, 7th, London, 1909, [Transactions], section 6b, p. 141-142.)

PKR

General discussion.

3404. **Reinitzer, Friedrich.** Über die Enzyme des Akaziengummis und einiger anderer Gumiarten. (Zeitschrift für physiologische Chemie, Hoppe-Seyler's, Strassburg, 1909, Bd. 61, p. 352-394.)

PKA

Notes the presence of an amylase in cherry gum, gum arabic and gum tragacanth.

3405. **Rinaldini, Theofilo.** Sulla digestione di vari amidi per opera dei secreti salivari, enterico e pancreatico. (Internationale Beiträge zur Pathologie und Therapie, Berlin, 1910-11, Bd. 2, p. 350-359.)

Available in Library of the New York Academy of Medicine.

Determines saccharogenic action of various animal amylases on a number of starches.

Abstract in *Chem. abst.*, 1911, v. 5, p. 1475.

3406. **Moreau, Edmond.** Étude biologique des miels. (Annales des falsifications, Paris, 1911, année 4, p. 65-66.)

VTD

Determines amylase in 20 samples of honey.

Abstract in *Chem. Zentr.*, 1911, Bd. 1, p. 1382.

3407. **Mosca, F. Traetta.** I fermenti nelle piante di tabacco Kentucky coltivate in Italia. (Gazzetta chimica italiana, Roma, 1913, v. 43, parte 2, p. 431-437.)

PKA

Notes the presence of amylase in tobacco leaves.

Abstract in *Chem. Zentr.*, 1914, Bd. 1, p. 271.

3408. **Oosthuizen, J. du P., and O. M. SHEDD.** The enzymes of the tobacco plant. (American Chemical Society, Journal, Easton, 1913, v. 35, p. 1289-1309.)

PKA

Note the presence of amylase in the tobacco seed and in the leaf.

3409. **Gothé, F.** Die Fermente des Honigs. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1914, Bd. 28, p. 273-286.)

VTa

A high diastase figure excludes suspicion of adulteration.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p. 1217; *Chem. Zentr.*, 1914, Bd. 2, p. 1463.

3410. — Experimentelle Studien über Eigenschaften und Wirkungsweise der Honigdiastase, sowie die Beurteilung des Honigs auf Grund seines Diastasegehaltes. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1914, Bd. 28, p. 286-321.)

VTa

Gives diastase content of 75 honeys. Notes effect upon activity produced by electrolytes, heat, alcohol precipitation, filtration and dialysis.

Abstract in *Chem. abst.*, 1915, v. 9, p. 1077; *Jour. soc. chem. ind.*, 1915, v. 34, p. 1024; *Chem. Zentr.*, 1914, Bd. 2, p. 1463.

3411. **Jacobson, C. A., and A. HOLMES.** Alfalfa investigations. 5. Enzymes present in alfalfa. (American Chemical Society, Journal, Easton, 1914, v. 36, p. 2170-2182.)

PKA

Determine saccharogenic activity.

Abstract in *Chem. Zentr.*, 1915, Bd. 1, p. 793.

3412. **Neidig, Ray E.** The survival of amylase in dried fodders. (American Chemical Society, Journal, Easton, 1914, v. 36, p. 1312-1314.)

PKA

Notes that a portion of the saccharogenic activity of fodders is retained after drying.

Abstract in *Chem. Zentr.*, 1914, Bd. 2, p. 430.

3413. **Shuey, Ralph C.** An investigation of the diastase of alfalfa and the effect of rapid curing upon the food value of alfalfa. (Journal of industrial and engineering chemistry, Easton, 1914, v. 6, p. 910-919.)

VOA

Finds an exceptionally high proportion of amylase in alfalfa.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p. 1167; *Chem. Zentr.*, 1915, Bd. 1, p. 900.

3414. **Thatcher, R. W., and GEORGE P. KOCH.** The quantitative extraction of diastases from plant tissues. (American Chem-

Amylases, continued.

Sources and Occurrence of Amylases, cont'd.
ical Society, Journal, Easton, 1914, v. 36, p. 759-770.) **PKA**

The amylase is extracted at 0° and saccharogenic activity determined by method of Sherman.

Abstract with criticism in *Analyst*, 1914, v. 39, p. 260. Reply to criticism in *Journal of the American Chemical Society*, 1914, v. 36, p. 2542-2543.

Abstract in *Chem. Zentr.*, 1914, Bd. 1, p. 1961.

3415. Blagoveschtschenski, A. Content of amylase in ripening horse beans. [Title translated.] (Russian Physical Chemistry Society, Journal, Petrograd, 1915, tome 47, p. 1529-1532.) **PKA**

The amount of amylase in the seeds of *Vicia faba*, L. changes approximately in the same way as the rate of accumulation of starch.

Abstract in *Jour. soc. chem. ind.*, 1915, v. 34, p. 66.

3416. Mann, Albert, and H. V. HARLAN. Morphology of the barley grain with reference to its enzyme-secreting areas. (United States.—Dept. of Agriculture, Washington, 1915, Bulletin no. 183, 32 p.) **VPK**

Reprinted in *Institute of Brewing, Journal*, London, 1916, v. 22, p. 73-108, *VTRA*.

Abstract in *Jour. soc. chem. ind.*, 1916, v. 35, p. 375.

3417. Bodnár, J., and G. DOBY. The part played by the amylase in potato tubers. (Abstract.) (Society of Chemical Industry, Journal, London, 1917, v. 36, p. 98.) **VOA**

Find a certain relation existing between the activity of the amylase and the proportion of non-reducing sugar and also between this activity and the total quantity of sugar.

3418. Hasselt, J. F. B. van. Eenige grepen uit de techniek der enzymen. (Pharmaceutisch weekblad, Amsterdam, 1919, jaarg. 56, p. 1682-1686.)

Available in Library of the Columbia College of Pharmacy.

An amyloclastic enzyme is obtained by extracting the pancreatic glands of cows or horses with 20% NaCl solution. The saccharogenic activity of the preparation is very low.

Abstract in *Chem. abst.*, 1920, v. 14, p. 591.

3419. Gore, H. C. Occurrence of diastase in the sweet potato in relation to the preparation of sweet potato syrup. (Journal of biological chemistry, Baltimore, 1920, v. 44, p. 19-20.) **PPB**

Potatoes are immersed in water, heated at 60-80° for 1 hour, the temperature raised

to the boiling point and held there until the potatoes become soft. The mixture is then filtered and the syrupy filtrate concentrated by evaporation. Determines diastatic power of sweet potato extracts.

Abstract in *Chem. Zentr.*, 1921, Jahrg. 92, p. 7.

3420. Sato, Masayoshi. Presence of amylase in milk and cheese. (Biochemical journal, Cambridge, 1920, v. 14, p. 120-130.) **PPB**

The claims by various workers that amylase is present in raw milk is confirmed. The enzyme is present, in varying quantities, in commercial Cheddar cheese. *Chem. abst.*

Abstract in *Chem. Zentr.*, 1920, Bd. 4, p. 503. *Bull. soc. chim. France*, 1921, série 4, tome 30.

3421. Windisch, W. Über die diastatische Kraft der derzeitigen Malze und deren Bedeutung für die Rohfruchtverarbeitung. (Wochenschrift für Brauerei, Berlin, 1920, Jahrg. 38, p. 143-147.)

Available in Library of the Department of Agriculture.

Gives results of 273 barley malt tests. The high diastase content of American malts attributed to the smallness of the grain, small grains exhibiting 1½ to 2 times the diastatic activity of an equal weight of large grains.

Abstract in *Chem. Zentr.*, 1921, Bd. 4, p. 964.

3422. Belehrádek, Jan. Versuche über Cellulase und die Amylase des Speichels in *Dixippus morosus*. (Auszug.) (Chemisches Zentralblatt, Leipzig and Berlin, 1922, Bd. 3, p. 393.) **PKA**

The enzyme exhibits marked amyloclastic activity but slight saccharogenic activity.

3423. Ducháček, F. Tschechoslovakische Malze und ihre diastatische Kraft. (Wochenschrift für Brauerei, Berlin, 1922, Jahrg. 39, p. 25-27.)

Available in Library of the Department of Agriculture.

Has examined a number of Czech and Slovak malts, and considers the diastatic power sufficiently high to permit of their being used in admixture with raw grain. *Chem. abst.*

Abstract in *Chem. Zentr.*, 1922, Bd. 2, p. 8. *Chimie et industrie*, 1922, v. 8, p. 1097.

3424. Sato, G. On the amylase of Korean ginseng. (Abstract.) (Physiological Abstracts, London, 1922-23, v. 7, p. 10.)

Available in Library of the New York Academy of Medicine.

Ginseng, both fresh and dried, contains amylase.

Amylases, continued.

Sources and Occurrence of Amylases, cont'd.

3425. Gore, H. C. Formation of maltose in sweet potatoes on cooking. (Industrial and engineering chemistry, Easton, 1923, v. 15, p. 938-940.) **VOA**

The presence of maltose in cooked sweet potatoes is shown by the agreement of the quantity of sugars determined by Cu reduction with the quantities measured by polarization and by its isolation in crystalline form. Gives evidence that the formation of maltose is due to diastase.

Abstract in *Chem. Zentr.*, 1923, Bd. 4, p. 954.

3426. Koga, Torao. Über die Fermente im Hühnerei. (Biochemische Zeitschrift, Berlin, 1923, Bd. 141, p. 430-446.) **PPB**

Notes the presence of amylase.

Abstract in *Chem. Zentr.*, 1924, Bd. 1, p. 353.

3427. — Zur Frage der Differenzierung tierischer und pflanzlicher Diastasen. (Biochemische Zeitschrift, Berlin, 1923, Bd. 142, p. 159-164.) **PPB**

The diastase from *B. coli* and *B. pyocyaneus* was activated by blood serum, thus exhibiting a difference from malt diastase, taka-diastase and other plant diastases and a similarity to animal diastases. — *Chem. abst.*

Abstract in *Jour. soc. chem. ind.*, 1924, v. 42, p. 28B; *Chem. Zentr.*, 1924, Bd. 1, p. 492.

3428. Noguchi, Y. Activity of several kinds of enzymes of rice in storage. (Abstract.) (Chemical abstracts, Easton, 1923, v. 17, p. 2893.) **PKA**

Includes a determination of amylase content over a period of 1½ years.

3429. Norris, Roland V., and B. VISWANATH. Cholam (*Andropogon sorghum*) as a substitute for barley in malting operations. (India, Agricultural journal, Calcutta, 1923, v. 18, p. 362-373.) **VXP**

Comparative starch hydrolyses by cholam and barley malts show that the cholam malt possesses the higher amylolytic but lower saccharogenic power.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 942A; *Chem. abst.*, 1923, v. 17, p. 3399.

3430. Girardet, N. F. Sur les ferments solubles de la racine de bryone. (Journal de pharmacie et de chimie, Paris, 1924, série 7, tome 30, p. 75-81.)

Available in Library of the New York Academy of Medicine.

Notes the presence of amylase in bryony root.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43, p. 887B.

3431. Maeda, Kiyomitsu. Über die Fermente im Fruchtwasser. (Biochemische Zeitschrift, Berlin, 1924, Bd. 144, p. 1-8.) **PPB**

By the method of Wohlgemuth finds a high amylase content.

3432. Oparin, A., and A. BACH. Über die Bedeutung des Sauerstoffs für die Fermentbildung in keimenden Pflanzensamen. (Biochemische Zeitschrift, Berlin, 1924, Bd. 148, p. 476-481.) **PKA**

Includes observations on amylase.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43, p. 920B.

3433. Yamasaki, Yoshio. Über die Fermente der Haut. (Biochemische Zeitschrift, Berlin, 1924, Bd. 147, p. 203-215.) **PPB**

Work includes a determination of amylase in skin; method of Wohlgemuth is used.

Abstract in *Chem. Zentr.*, 1924, Bd. 2, p. 848.

3433A. Englis, D. T., and H. A. LUNT. Effect of the concentration of potassium salts in soil media upon the carbohydrate metabolism of plants. The diastatic activity of the nasturtium. (Soil science, Baltimore, 1925, v. 20, p. 459-463.) **PTK**

Abstract in *Chem. abst.*, 1926, v. 2, p. 1297.

3434. Joszt, A., and B. STARCZEWSKI. Diastatic power of the juice of different varieties of potatoes. (Abstract.) (Chemical abstracts, Easton, 1925, v. 19, p. 1584.) **PKA**

Also abstracted in *Chem. Zentr.*, 1924, Bd. 1, p. 2784.

3435. Sato, Masayoshi. The presence of amylase in milk and cheese. (Abstract.) (Experiment station record, Washington, 1925, v. 52, p. 503.) **VPG (United States)**

Reports the presence of amylase in samples of grade A certified milk and in American Cheddar cheese. A comparison of the rate of digestion of various starches by the amylase showed soluble potato starch to be digested more easily than rice starch and this in turn more easily than ordinary potato starch.

3435A. Viswanath, B., and M. SURYAN-ARAYABA. Cholam (*Andropogon sorghum*) as a substitute for barley in malting operations. 3. Hydrolysis of starch by cholam malt extract. (Institute of Brewing, Journal, London, 1925, v. 31, p. 425-429.) **VTRA**

Compare rate of hydrolysis by cholam malt and barley malt. Believe that two enzymes are present, an amylase and a dextrinase. At a temperature of 85° the dextrinase is inactivated and the only action is the conversion of starch to dextrin. In the

Amylases, continued.

Sources and Occurrence of Amylases, cont'd.

initial stage of conversion by cholam malt extract at 30°, no maltose is observed for the first hour. It is supposed that the starch is first degraded to dextrin before conversion to sugar takes place.

Abstract in *Chem. abst.*, 1926, v. 20, p. 2045.

3436. Wedemann, W. Ist die Kuhmilchdiastase (Amylase) zur Erkennung schonenden Dauerpasteurisierung geeignet? (*Zeitschrift für Fleisch und Milchhygiene*, Berlin, 1925, Bd. 35, p. 301-304.)

Available in Library of the New York Academy of Medicine.

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 1569.

INDUSTRIAL APPLICATIONS OF AMYLASES

3437. Payen, A., and PERSOZ. Sur la diastase, les principaux produits, de ses réactions, et leurs applications aux arts industriels. (*Annales de chimie et de physique*, Paris, 1833, série 2, tome 53, p. 73-92.)

PAA

Detail preparation of diastase and dextrin and their industrial applications.

Also in *Annalen der Physik und Chemie*, Poggen-dorff's, Leipzig, 1834, Bd. 32, p. 174-193, PAA.

Condensed in *Annalen der Pharmacie*, Liebig's, 1834, Bd. 12, p. 295-299; *Société d'encouragement pour l'industrie nationale*, Bulletin, Paris, 1833, année 32, p. 230-237.

3438. Paraf, Mathias. Sur l'emploi de la diastase pour désapprêter les étoffes. (*Société industrielle de Mulhouse*, Bulletin, 1861, tome 31, p. 84-85.)

VA

Directions for the use of malt in desizing cotton print and calicos.

Abstract in *Bull. soc. chim. Paris*, 1861, année 3, p. 135-136; *Wag. Jahr.*, 1861, Jahrg. 7, p. 597.

3439. Schaeffer. Sur l'emploi de la diastase dans les fabriques d'indiennes. (*Société industrielle de Mulhouse*, Bulletin, 1861, tome 31, p. 85.)

VA

3440. Removing starch from cotton. (Abstract.) (*Society of Chemical Industry*, Journal, London, 1889, v. 8, p. 539.)

VOA

The yarn is placed in a bath containing malt extract.

3441. Lohmann, A. Diastafor, ein praktisches Hilfsmittel im Dienste der Färberei, Druckerei und Appretur. (*Färber-Zeitung*, Berlin, 1906, p. 158-159.)

† VLA

Abstract in *Wag. Jahr.*, 1906, Jahrg. 52, Abt. 2, p. 464.

3442. Pollak, Isidor. Über diastatische Präparate und deren praktische Anwendung. (*Chemiker-Zeitung*, Cöthen, 1906, Jahrg. 30, p. 219-220.)

†† VOA

Discusses use in baking and textile industries.

Abstract in *Chem. Centr.*, 1906, Bd. 1, p. 1468.

3443. Schmidt, Alfred. Diastafor. (*Färber-Zeitung*, Berlin, 1906, p. 208-211.)

† VLA

Abstract in *Wag. Jahr.*, 1906, Jahrg. 52, Abt. 2, p. 464.

3444. Deutsche Diamalt Gesellschaft. Diastafor als Mittel zur raschen und vollständigen Entschlichtung und zur Herstellung von Appreturmassen, Schlichten und Druckverdickungen. (*Textil- und Färber-Zeitung*, Berlin, 1907, Jahrg. 5, p. 796-811-822.)

Available in Library of the Chemical Club.

The article describes methods of using this malt preparation for removing size from mercerized fabrics, velvet and plush. The sizing of warps and the preparation of solutions for finishing are fully discussed.

3445. Krais, Paul. Versuche mit Diastafor. (*Chemiker-Zeitung*, Cöthen, 1907, Jahrg. 31, p. 1160-1161.)

†† VOA

Describes method for removing size from cotton with diastafor.

Abstract in *Chem. abst.*, 1908, v. 2, p. 464.

3446. Ford, John S., and JOHN M. GUTHRIE. The amylolytic and proteolytic ferments in wheaten flours, and their relation to "baking value." (*Society of Chemical Industry*, Journal, London, 1908, v. 27, p. 389-394.)

VOA

Conclude that, other factors being equal, the baking value is proportional to the amount of amylase present.

Abstract in *Chem. abst.*, 1908, v. 2, p. 204; *Chem. Zentr.*, 1908, Bd. 2, p. 341.

3447. Neumann, M. P., and P. SALECH. Über den Einfluss diastasereicher Maltpräparate auf die Backresultate. (*Landwirtschaftliche Jahrbücher*, Berlin, 1908, Jahrg. 37, p. 857-872.)

VPA (Pruss)

The amylase has the effect of increasing the volume of the loaf without decreasing the quality. Addition of sugar did not produce the same results.

Abstract in *Chem. abst.*, 1909, v. 3, p. 100; *Chem. Zentr.*, 1908, Bd. 2, p. 722.

3448. Pflugradt, A. Die Verwendung von Diastafor bei der Kälberaufzucht. (*Milch-Zeitung*, Leipzig, 1908, Jahrg. 37, p. 2-4.)

† VP

Amylases, continued.

Industrial Applications of Amylases, cont'd.

3449. Puckner, W. A. Diastase ferments. Report of an examination of the diastase ferments by the Council on Pharmacy and Chemistry. (American Medical Association, Journal, Chicago, 1908, v. 51, p. 140-142.)

Available in Library of the New York Academy of Medicine.

The activity of 12 commercial preparations is determined by method of Johnson.

Abstract in *Chem. abst.*, 1909, v. 3, p. 577.

3450. Heger, Hans. Die neuen Arzneimittel und Spezialitäten des 1. Halbjahres 1909. (Auszug.) (Chemisches Central-Blatt, Berlin, 1909, Bd. 2, p. 1687.) **PKA**

Mentions a sirup, termed amylo-diastase, which contains phosphates and the natural diastases of germinated barley.

3451. Humphries, A. E., and A. G. SIMPSON. Gas-making capacity as a factor in the estimation of strength in wheaten flours. (International Congress of Applied Chemistry, 7th, London, 1909, [Transactions], section 6a, p. 27-38.) **PKR**

Includes evidence that the rate at which starch granules are attacked and not the activity of the diastatic enzymes themselves is the prime factor which determines the gas-making capacity of a flour.

3452. May, R. J. Malt enzymes and their employment in the textile industries. (Society of Dyers and Colourists, Journal, Bradford, 1911, v. 27, p. 88-92.) **†VLG**

Describes use of preparations in sizing, finishing, stripping, preparing cloth for mercerization and thickening for printing colours.

3453. Hamburg, Max. Enzymes of malt and their employment in the textile industry. (Society of Dyers and Colourists, Journal, Bradford, 1912, v. 28, p. 7-14.) **†VLG**

Briefly reviews literature on diastase. Discusses application of "diastafor" for removal of sizing, for degumming and for production of uniform finishes.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 124; *Chem. abst.*, 1912, v. 6, p. 1530.

3454. Les Produits "diastase" dans l'industrie textile. (Revue générale des matières colorantes de la teinture, Paris, 1912, tome 16, p. 172-174.) **†VLG**

Discusses use of malt enzymes, particularly diastafor.

3455. Report of the Council on Pharmacy and Chemistry.—Taka-diastase and liquid

taka-diastase. (American Medical Association, Journal, Chicago, 1912, v. 59, p. 50-51.)

†WAA

Several samples of taka-diastase were tested by determining the amount required to digest a 2% starch solution to the achromic point in 10 minutes. Due to the rapid loss in activity of the preparations and also the misleading claims made by the manufacturers these products are not listed among the approved New and Non-official remedies.

3456. Battegay, M. Diastase als Stärkelösungsmittel. (Färber-Zeitung, Berlin, 1912, Jahrg. 23, p. 133-134.) **†VLA**

Summarizes literature on application of diastase as a desizer. "Diastafor extra" was shown to be distinctly superior to "diastafor" and malt extract preparations.

Duplicate abstracts in *Chem. abst.*, 1913, v. 7, p. 1294; *Jour. soc. chem. ind.*, 1912, v. 31, p. 427.

3457. Galli, Enrico, and ADRIANO CERADINI. La diastasi nella panificazione. (Reale istituto lombardo di scienze e lettere, Rendiconti, Milano, 1912, serie 2, v. 45, p. 546-555.) ***ER**

Addition of diamalt increases the loaf volume and improves the quality of the bread.

Abstract in *Chem. abst.*, 1913, v. 7, p. 2805.

3458. Peters, August. Diastafor und Diastase: Katalysatoren und Katalyse. (Leipziger Färber-Zeitung, Leipzig, 1913, Jahrg. 62, p. 411-413.) **†VLA**

A general discussion of the action and use of the commercial product "diastafor," especially its action upon starch or dextrin residues in cloth; also of various catalyzers employed in preparing, printing, and finishing textiles.—*Chem. abst.*

3459. Use of malt extracts in paper making. (Pulp and paper magazine of Canada, Toronto, 1913, v. 11, p. 96-97.)

†VMPA

Discusses use of malt amylase in the removal of starch and as a dextrinizing agent.

3460. Berger, Clément. Application de l'extrait de malt à l'apprêt des étoffes. (Revue générale de chimie pure et appliquée, Paris, 1914, tome 17, p. 174-179.) **VOA**

Discusses application of malt amylase in the textile industry and gives formulas for sizing.

Abstract in *Chem. abst.*, 1914, v. 8, p. 2951.

3461. Takamine, Jokichi. Enzymes of *Aspergillus oryzae* and the application of its amylolytic enzyme to the fermentation in-

Amylases, continued.

Industrial Applications of Amylases, cont'd.
dustry. (Journal of industrial and engineering chemistry, Easton, 1914, v. 6, p. 824-828.) **VOA**

In Japan the total value of commodities produced by this fungus aggregates two hundred million dollars. Details process of preparing taka-koji in a rotating pneumatic drum; wheat bran is used as a culture medium for the fungus, which has been previously acclimatized to an antiseptic. Conversions of corn and rye mashers are described.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p. 1068; *Chem. Zentr.*, 1915, Bd. 1, p. 848.

3462. Musgrave, A. F. Malt extract in the laundry. A useful compound that renders starch soluble. (Scientific American supplement, New York, 1916, v. 82, p. 107.)

Popular discussion. Briefly outlines procedure for removing starch from laundered goods. States that malt extract is known by the trade names clenbumol, brimal, farinol and balmal.

3463. Pollak, Isidor. Über Diastasepräparate und deren Anwendung. (Chemiker-Zeitung, Cöthen, 1916, Jahrg. 40, p. 13-14.) **†† VOA**

Discusses use of diastase preparations in bakeries and use in textile industries for removing starchy dressings from fabrics and for producing uniform soluble starch and dextrins.

Abstract in *Jour. soc. chem. ind.*, 1916, v. 35, p. 419.

3464. Van Deusen, W. Diastase in the laundry. (Scientific American supplement, New York, 1917, v. 84, p. 35.) **†† VA**

3465. Wallerstein, Leo. Enzymes in the fermentation industries. (Franklin Institute, Journal, 1917, v. 183, p. 531-556, 715-734.) **VA**

Includes discussion of properties and activity of amylase.

3466. The Industrial application of enzymes of *Aspergillus oryzae*. (Textile recorder, Manchester, 1919-20, v. 37, p. 445.) **† VLA**

The enzymes of *Aspergillus oryzae* differ from those of malt in that they hydrolyze starch completely, the chief product being glucose. These enzymes are used to clarify fruit jellies and to prepare soluble starch and dextrins.

Abstract in *Chimie et industrie*, 1921, v. 5, p. 457.

3467. Comparison between malt extract and enzymes of the *Aspergillus oryzae* (polyzime) as applied particularly to use in the textile industry. (Textile recorder, Manchester, June 15, 1920, v. 38, p. 64-66.) **† VL**

Although exhibiting less saccharogenic activity, the amylolytic activity of polyzime is 3 to 4 times greater than that of malt extract.

Abstract in *Chimie et industrie*, 1920, v. 4, p. 75.

3468. Malt extracts and shortening agents registered by the American Institute of Baking. (American Institute of Baking, Minneapolis, 1921, Bulletin 6, 7 p.) **VT**

Eleven malt extracts and syrups are included in the list.

3469. Huenlich. Schlichten der Garne und Ausrüsten von Stuhlwaren. (Zeitschrift für das gesamte Textilindustrie, Leipzig-Reudnitz, 1921, Jahrg. 24, p. 278.) **†† VL**

Gives directions for use of diastafor.

3470. Moucka, F. Das Verzuckerungsvermögen des Malzes im Laboratorium und der Praxis. (Allgemeine Brauer- und Hofen-Zeitung, Nürnberg, 1921, Jahrg. 61, 1229-1230.)

Available in Library of the Department of Agriculture.

Abstract in *Chem. Zentr.*, 1922, Bd. 2, p. 276.

3471. Tagliani, Giovanni. Neue Diastasepräparate und ihre Bedeutung für die Textilindustrie. (Zeitschrift für angewandte Chemie, Leipzig, 1921, Jahrg. 34, p. 69-73.) **PK**

Gives general discussion of commercial diastatic preparations. Compares activity of ferments D and A and ferment DS and DB. The latter, which is rich in animal amylase, was found most effective. Gives 3 photomicrographs of raw textile fabrics before and after fermentol treatment.

Abstract in *Chem. abst.*, 1922, v. 16, p. 222; *Chem. Zentr.*, 1921, Bd. 2, p. 755; *Chimie et industrie*, 1921, v. 6, p. 819-820 (microphotographs).

3472. Windisch, W. Die Diastase des Malzes und ihre besondere Berücksichtigung in der nächsten Mälzereikampagne. (Wochenschrift für Brauerei, Berlin, 1921, Jahrg. 38, p. 167-169.)

Available in Library of the Department of Agriculture.

Specially emphasizes the fact that a malt should exhibit a marked amylolytic activity as well as saccharogenic activity.

Abstract in *Chem. Zentr.*, 1921, Bd. 4, p. 965.

Amylases, continued.

Industrial Applications of Amylases, cont'd.

3473. Collatz, Ferdinand A. Flour strength as influenced by the addition of diastatic ferments. (American Institute of Baking, Minneapolis, 1922, Bulletin 9, 72 p.) **VTA**

Optimum saccharogenic activity of the malt flour occurred at a temperature of 65° and pH of 4.26, the latter being determined at 25°. Concentrations of added diastase exert their greatest effect in the first 10% of added malt flour. The surplus of sugars produced by the enzyme disappears as the activity of the yeast increases. Gas producing capacity of weak flours was greatly increased when fermented with added malt extract; this was not the case, however, with strong flours. In all cases the use of malt extract gave a superior loaf of bread in volume, grain and texture. Twelve figures and 41 tables are given.

Abstract in *Chem. abst.*, 1923, v. 17, p. 835.

3474. Removing sizing compounds from textile fabrics with diastase preparations. (Color trade journal, New York, 1922, v. 11, p. 257-258.) **VOA**

Gives methods for preparation and use of "polyzyme."

3475. Fermasol. (Textile world journal, New York, 1922, v. 62, p. 1801.) † **VLA**

States that fermasol is an enzymic preparation of animal origin. Gives directions for its use as a destarching agent.

Reprinted in *Color trade journal*, New York, 1922, v. 11, p. 173, † **VOA**.

3476. Hall, A. J. Starch products and malt extracts used in textile treatment. (Textile colorist, New York, 1922, v. 44, p. 776-777, 781-782; 1923, v. 45, p. 29-30.) † **VLA**

Condensed in *Chimie et industrie*, 1923, v. 10, p. 331-332.

3477. Rumsey, Louys A. The diastatic enzymes of wheat flour and their relation to flour strength. (American Institute of Baking, Minneapolis, 1922, Bulletin 8, 84 p.) **VTA**

Determines effect of diastatic enzymes of wheat flour in panary fermentation with respect to concentration, time, temperature and acidity. Sodium molybdate and basic lead acetate retard saccharogenic activity; the former regarded as the most effective clarifying agent. Maximum activity of flour diastase in a dough at any temperature or pH is not reached at once because of insufficient water. Other factors being equal

the flour showing the greater diastatic activity should show the greater baking value. Ten figures and 23 tables are given.

Abstract in *Chem. Zentr.*, 1924, Bd. 1, p. 2216.

3478. Mose, W. L. Diastase from the technical aspect. (Chemical engineering and mining review, Melbourne, 1923, v. 15, p. 328-330.) **VHA**

A discussion of the action of diastase on starch and methods of preparation of malt. — *Chem. abst.*

3479. Aufschliessen der Stärke mit Diastafor. (Textilberichte, Melland's, Mannheim, 1923, Jahrg. 4, p. 396.) **VLA**

3480. Aufschliessen der Stärke für Schlichtzwecke. (Textilberichte, Melland's, Mannheim, 1924, Jahrg. 5, p. 487.) **VLA**

3481. Appleyard, J. R. Novo fermasol a new product for desizing and destarching. (Color trade journal, New York, 1925, v. 16, p. 116-118.) † **VOA**

3482. Cahn, G. The digestive activity of several commercial enzyme preparations. (Abstract.) (Chemical abstracts, Easton, 1925, v. 19, p. 1031.) **PKA**

3483. Collatz, Ferdinand A., and O. C. RACKE. Effects of diastase and malt extract in doughs. (Cereal chemistry, St. Paul, 1925, v. 2, p. 213-227.) **VPMA**

The Lintner diastase value of a flour is not an accurate index of its converting powers in a dough. Using the flour as substrate, an accurate idea of the reducing sugars which will be formed in a dough can be estimated. When diastatic malt extract is added to a dough, a large amount of conversion takes place in mixing, this being evidenced by a soft, wet, or sticky dough. The addition of malt extract to flours of average baking strength apparently decreases the quality of the resulting bread.

3484. Use of rapidase. (Color trade journal, New York, 1925, v. 16, p. 22-23.) † **VOA**

Rapidase is a bacterial enzyme belonging to the species *subtilis* or *mesentericus*. The enzyme is particularly resistant to high temperatures and to the action of alkalis.

3485. Grimshaw, A. H. Celanese and cotton mixtures. (Textile world, New York, 1925, v. 67, p. 579-581.) † **VLA**

Carries out comparative desizing tests with diastafor and rapidase.

INDEX OF AUTHORS

Numbers refer to individual entries, not to pages

A

Abadie, Aug., 2460.
 Abderhalden, Emil, 2972-2973.
 Abelous, J. E., 792.
 Abrams, Allen, 1322.
 Adam, A., 3170.
 Adams, Edwin W., 3202.
 Adams, Roger, 1099.
 Adler, L., 2935.
 Adlung, M., 2204-2205.
 Adersen, Vald., 3304A.
 Aerde, M. van, 1662.
 Agalhon, H., 3075.
 Agullion, Henri, 2876.
 Aimé, G., 1720.
 Albers, J. F., 1801.
 Albo, G., 3396.
 Albrecht, Felix, 3013.
 Alcock, F. N., 1175.
 Alexander, Jerome, 341.
 Allen, Paul W., 2532, 3310.
 Allen, S. W., 2537.
 Allihn, Felix, 46, 50.
 Aloy, J., 792.
 Alpers, K., 1787.
 Alsberg, Carl L., 817-818, 1328, 1353.
 Amar, Jules, 1392.
 Ambard, L., 3100, 3102, 3106A.
 Amberger, K., 1861.
 Ambuehl, G., 1713.
 Amthor, Carl, 226, 1583.
 Andés, Louis E., 2478.
 Ando, F., 2902.
 Andrews, Launcelot W., 910.
 Angelescu, E., 960A.
 Anthon, E. Friedr., 31, 33, 42, 1189, 2178, 2386, 2388-2389.
 Aoi, Ren-Ichiro, 604.
 Appleyard, J. R., 3481.
 Apsit, J., 2869, 3039.
 Arbaumont, J. d', 1421.
 Arcet, d', 2170, 2416A.
 Archbold, George, 2058, 2226, 2287.
 Arendt, Oskar, 769.
 Armani, G., 1845.
 Armstrong, Henry E., 2647.
 Arnold, Robert B., 87.
 Arochequesne, G., 3379.
 Arpin, 1981.
 Arthus, Maurice, 2816.
 Artus, 2450.
 Arzberger, C. F., 3323.
 Arzichowski, V., 1347.
 Asarnoj, S., 3327.
 Asboth, Alexander von, 1016, 1458-1460, 1468.
 Ashe, Lauren H., 3318.
 Astruc, A., 3142.
 Atkins, W. R. G., 770.
 Atkinson, R. W., 3224-3225.
 Aufrecht, 1989.
 Auguet, A., 1639.
 Aulard, A., 2303.
 Auty, R. A., 329.
 Auzinger, A., 3125.
 Aversenq, J. P., 3083.
 Avery, O. T., 3324.
 Ayyangar, P. A. R., 2137, 2932.

B

Babington, F. W., 1698.
 Bach, A., 3432.
 Bachrach, E., 1108.
 Backer, F. H., 1965.
 Bacon, Raymond F., 2071.
 Bailey, C. H., 2587.
 Bailey, E. M., 1502.
 Baily, Walter, 1198, 1201.
 Bainbridge, F. A., 2852.
 Baker, J. C., 589.
 2114, 2749, 2858, 3207.
 Bakhuyzen, H. L. van de Sande, 818A.
 Baldwin, M. E., 2952.
 Balland, 1954, 2055.
 Ballot, Buis, 1046.
 Baly, E. C. C., 819, 3084.
 Bamberger, Max, 1033.
 Bang, Ivar, 2883.
 Bantlin, Gerhard, 763.
 Barab, J., 1086.
 Barbet, Émile, 110, 3380.
 Barboni, L., 1845.
 Bardt, A. Ya., 96.
 Barfoed, C., 1936-1937.
 Barger, George, 926, 953.
 Barrell, G. G., 2164.
 Barrett, O. W., 2104.
 Barth, G., 2670.
 Bartholomew, E. T., 2712.
 Bartow, Edward, 2426A.
 Basset, 1995.
 Baswitz, M., 177, 2787-2788.
 Battegay, M., 3456.
 Bau, Arminius, 1470, 1883.
 Bauch, H., 1855.
 Baudisch, Oskar, 800.
 Baudrimont, E., 849.
 Baudry, A., 1518-1519.
 Bauer, E., 62.
 Bauer, H. F., 111, 2397.
 Baumann, C., 1562.
 Baumann, Karl, 1822.
 Baumert, G., 1544, 1683, 1691.
 Baumgarten, Arnold, 2938.
 Bauml, A., 192.
 Baur, Amalie, 2761.
 Baur, Emil, 1690.
 Beadle, C., 1018, 1068.
 Beam, William, 2807.
 Bean, Percy, 2509.
 Béchamp, Auguste, 843-844, 1054-1055, 1057, 112, 1129, 1134, 1217, 3219, 3230, 3241, 3362.
 Bechold, H., 1238.
 Beck, Franz, 796.
 Becker, B., 1007.
 Beckmann, Ernst, 717, 1820.
 Beckurts, H., 879.
 Bednarski, B., 2834.
 Becker, 715.
 Behre, A., 1511, 1650-1651.
 Behrend, Paul, 1684, 1733-1734.
 Beijerinck, Martinus W., 577, 1219, 1261, 2655, 32, 32A.
 Beiser, Arthur, 416, 612.
 Belehrádek, Jan, 3422.
 Bellier, J., 1830.
 Belluci, G., 1593.

- Belval, H., 2159.
 Benedict, Hans, 2422A.
 Benedict, S. R., 3006.
 Bengel, F., 1846.
 Bengel, F. Baden, 199.
 Benner, Ch., 2442.
 Benrath, A., 1286.
 Bensemann, R., 1449.
 Berard, Édouard, 4.
 Berczeller, L., 780, 783, 936, 938, 946, 954, 1255,
 1387, 2939-2940, 2974, 2989.
 Berentzen, Hans, 1124.
 Berg, J. C. v.d., 1085.
 Bergé, Albert, 71, 2393.
 Bergeim, Olaf, 2920.
 Berger, Clément, 3460.
 Berger, J., 2240, 2249.
 Bergman, Stig., 947.
 Bergmann, Max., 796, 955-956.
 Bergquist, Carl, 1323, 1331.
 Berl, E., 1079, 1082.
 Berry, A. F., 398.
 Bersch, Wilhelm, 2047.
 Bert, P., 2792.
 Berthelot, 1061, 1064, 1199, 1208.
 Berthold, G., 2014.
 Bertin, A., 1200.
 Berzelius, Jacob, 989, 994.
 Bettinger, P., 1163, 3313-3314, 3325.
 Beutell, A., 1880.
 Bevan, E. J., 1018, 1068, 1075, 1078, 1240.
 Beyer, Artur, 2767.
 Beythien, A., 1974.
 Bial, Manfred, 3373, 3376.
 Bialosuknia, W. W., 3397.
 Bianchi, A., 1481.
 Bidard, 1797.
 Bidwell, G. L., 1655.
 Bidziński, Z., 3017.
 Biedermann, W., 369, 590, 595, 1104-1105, 1107,
 1109-1110, 1112, 1118-1119, 1121-1122, 2742,
 2750-2751, 2957, 2978, 2990, 3007, 3053.
 Bielecki, Jean, 749.
 Bierbrauer, B., 1574.
 Bierry, H., 339, 2681, 2841, 2845, 2853, 2859, 2903,
 2975, 3047.
 Biltris, A. N. H., 801.
 Biltz, Wilhelm, 359, 914, 1247-1248.
 Binder, O., 730.
 Bintz, A., 1310.
 Biot, 25, 29-30, 436, 1398.
 Biourge, Ph., 1494.
 Birschard, F. T., 784.
 Blagoveschtschenski, A., 3415.
 Blake, J. C., 370, 374, 785, 793.
 Blanksma, J. J., 1774.
 Blasweiler, Th. E., 2586.
 Bloch, 1003, 1723, 1949.
 Bloemendal, W. H., 560.
 Blome, W. H., 3122.
 Blondeau, Ch., 995, 1045, 1135.
 Blondlot, 845, 1402.
 Blount, E., 2948.
 Blumenwitz, Julius, 2453.
 Blumk, Gustav, 2533.
 Blunck, Gustav, 1847.
 Boa, Peter, 929.
 Bobertag, O., 1241.
 Bode, G., 1683, 2291, 3073.
 Bode, H., 1691.
 Boden, H., 2840.
 Bodnár, J., 2720, 3165, 3417.
 Boehm, Josef, 687.
 Boehm, R., 1092.
 Boehne, Carl, 2976.
 Boehnke-Reich, Heinrich, 2009.
 Böeseken, J., 1085.
 Boettger, R., 835, 1804, 1925, 2458, 2461.
 Boettinger, Carl, 1069.
 Boidin, A., 722, 725, 1360, 1488, 3252, 3258.
 Bokorny, Th., 1112A, 2698, 2715-2716, 2732, 2752,
 2936.
 Bondonneau, Lucien, 40-41, 61, 873, 1142, 1729,
 1938, 2259, 2384-2385, 2387.
 Bonifazi, G., 1644.
 Bordier, H., 932, 934.
 Born, S., 2717.
 Borntraeger, Hugo, 1823, 2475.
 Borries, Georg, 1868.
 Bottazzi, F., 574, 731.
 Bouchardat, G., 28, 2418, 2781, 3351.
 Bouillon-Lagrange, 2374.
 Bouriat, 17-18, 2162.
 Bourquelot, E., 1884, 2640, 3028.
 Bourquelot, Em., 200-201, 1884.
 Boussingault, 1876.
 Boutaric, A., 1414.
 Bouyer, J., 1654.
 Boyle, C., 2140.
 Braconnot, H., 1044.
 Bradford, Samuel C., 1272.
 Bradley, H. C., 3130.
 Braeutigam, Walter, 81.
 Brann, Albert, 786.
 Brasse, L., 195, 3364.
 Braudo, Yek M., 2726.
 Brauer-Tuchorze, J. E., 205, 1750.
 Braun, M., 1664.
 Brester, A., 669.
 Breuer, O., 2469.
 Breusing, R., 3365.
 Briant, L., 2119.
 Briggs, J. F., 1078.
 Briois, 1438.
 Briot, A., 2854.
 Brocq-Rousseau, 2685.
 Broessler, J., 2235-2236, 2260, 2266.
 Bromley, Henry A., 1501.
 Brooks, H. E., 939.
 Brooks, R. O., 1688.
 Brown, H. H., 1263.
 Brown, Horace T., 178, 183, 196, 211, 254-255, 273-
 275, 287-288, 303, 443, 708, 1071, 1221, 1233,
 1617, 1621, 3123, 3368, 3374, 3377.
 Browne, C. A., 127, 1279, 1478, 1957, 1960.
 Bruecke, Ernst, 159.
 Bruhns, G., 1512, 1862.
 Brukner, Bruno, 537.
 Brunacci, Bruno, 732, 2870-2871.
 Brunnér, C., 27.
 Bruylants, G., 1610.
 Bruyn, C. A. Lobry de, 1225.
 Bruyne, F. de, 2729.
 Bryan, A. H., 1960.
 Bryan, T. J., 1893.
 Bryant, Arthur P., 112-113, 2326, 2329.
 Buchanan, J. H., 1433.
 Buchler, C. C., 1090.
 Buchner, Eduard, 3263.
 Budnikoff, P. P., 132.
 Buel, Hambden, 1313.
 Buelow, K., 267.
 Buerklin, Elisabeth, 640.
 Buettler, Rob., 1082.
 Buetschli, O., 1410-1411.
 Buglia, G., 2877.
 Buisson, M., 1538.
 Bujard, Alfons, 1474.
 Bungenberg, H. G. de Jong. *See* Jong, H. G. Bungen-
 berg de.
 Bungener, H., 1584, 3112.
 Buraczewski, J., 2692.

Burge, W. E., 2904.
 Burggraf, de, 2413A.
 Burgstaller, 928.
 Burkhard, G., 1674.
 Burnett, H. R., 1643.
 Burres, Opal, 2873.
 Burton, Alfred, 1860.
 Burtt-Davy, Joseph, 2357.
 Buscalioni, L., 545.
 Busch, W., 3352.
 Busgen, M., 3229.
 Butkewitsch, W., 2618.
 Buttenshaw, W. R., 2059.

C

Cahn, G., 3482.
 Cailletet, 1439.
 Caldwell, Mary L., 383, 2773, 2970, 2984-2985, 3008, 3022.
 Callias, H., 1997-1998.
 Callow, Ernest H., 1298.
 Calmette, 3242, 3271.
 Calvert, F. Grace, 2179.
 Calvin, John W., 2925.
 Calvino, E. M., 1870.
 Campari, G., 693.
 Campbell, George F., 2608.
 Campell, 1999.
 Canet, M., 3183.
 Cantanni, Eugenio, 2878.
 Cappenberg, H., 1311.
 Cappuyns, A., 1557.
 Carey, Cornelia L., 1167.
 Carles, P., 1899.
 Carlson, A. J., 3398.
 Caspary, A., 3212.
 Cassel, C., 1707.
 Castan, Pierre, 499.
 Castoro, N., 921.
 Cathcart, W. R., 2361, 2523, 2544.
 Catoire, M., 601, 607, 618.
 Caventon, J. B., 1125.
 Cazeneuve, P., 691, 3090.
 Ceradini, A., 3457.
 Cerighelli, R., 2131.
 Challet, Élie, 1646.
 Chalmot, G. de, 1020.
 Chamberlain, G. E., 1292.
 Chandelon, 2189.
 Chandler, C. F., 2283.
 Chapin, R. M., 1160.
 Chaplet, A., 2507.
 Chapman, A. Chaston, 3326.
 Chapmann, 1594.
 Chase, Winn W., 3148.
 Chastaing, P., 874.
 Chatterjee, N. R., 776.
 Chauchard, A., 3076, 3078-3079.
 Chesnut, V. K., 2157.
 Chevallier, J.-B., 1874.
 Chevreul, 151, 437.
 Chicandard, G., 2466-2467.
 Chittenden, R. H., 188, 2793-2794, 2798-2801, 3026.
 Chlodonsky, K., 268.
 Chodat, Fernand, 3104.
 Chodat, R., 410, 1871.
 Chowdhury, J. K., 1094.
 Chrétien, E., 942.
 Christiani, Rud., 2326A.
 Chrzaszcz, Tadeusz, 1665, 2693, 2695, 2699, 2774, 2941, 3009, 3017, 3037, 3040, 3059, 3126, 3272.
 Church, Margaret B., 3345.
 Churchill, Helen, 2145.
 Claesson, Peter, 676.
 Clark, Ernest D., 461, 1155, 1645, 3191.
 Clark, Frederick C., 1507.
 Clark, George L., 1280.
 Classen, A., 963, 965-966.
 Claubry, Gaultier de, 829, 1790A-1790B, 2165-2166, 2413B-2414, 2416, 2436A.
 Claus, Johannes, 1980.
 Claus, Prescher, 1980.
 Claus, Reinhold, 1980.
 Clayson, D. H. F., 605.
 Clayton, W., 1273.
 Clément, 3217.
 Clementi, A., 930.
 Clemm, Walther Nic., 304.
 Clerget, A., 2171.
 Clevenger, J. F., 2143.
 Clifford, Winifred M., 3018.
 Cloez, 1728.
 Cluett, E. H., 2552A.
 Cluss, Ad., 2148.
 Cluss, H., 281.
 Cobenzl, A., 54.
 Cobleigh, W. M., 1611.
 Coe, M. R., 1655-1656, 1663, 1666.
 Cohen, I., 3146.
 Cohnheim, 2636.
 Cole, Sydney W., 2836.
 Colin, H., 829, 2120, 2159.
 Collatz, Ferdinand A., 3473, 3483.
 Collens, A. E., 366.
 Collin, Eugène, 1827, 1835, 1843, 1896, 1903.
 Colwell, H. A., 739.
 Comar, Ferdinand, 1996.
 Congdon, Leon, 1848.
 Coninck, W. Oechsner de, 97-99, 101-106, 737.
 Cook, Donald H., 3068.
 Coombs, F. E., 380.
 Cooper, W. F., 2567.
 Cope, W. C., 1086.
 Corvisart, L., 662.
 Costa, Domenico, 810.
 Coster, D. J., 1932.
 Coupland, H. S., 78.
 Courtonne, H., 1348.
 Coutaret, 156.
 Couverchel, 21.
 Cownley, A. J., 1950.
 Craik, James, 1039.
 Cramer, C., 659.
 Cramm, L. E. von, 2079.
 Crawford, Gilbert, 87.
 Creuzberg, H. Ch., 1396.
 Cripps, R. A., 3113.
 Crispo, D., 1524-1525, 1528.
 Croftan, Alfred C., 2615.
 Crohn, B. B., 2927.
 Croll, Hilda M., 1653.
 Cronheim, W., 2424B.
 Cross, Charles F., 1018, 1068, 1075, 1078, 1240.
 Crossmann, T., 1472.
 Crown, Harry A., 1550-1551, 1554.
 Crueger, Hermann, 518.
 Cruto, Alfonso, 408-409.
 Cuisinier, Léon, 191, 197.
 Cullen, Glenn E., 3324.
 Cummins, Geo. W., 2799-2800.
 Curry, W. F., 2579.
 Currie, James N., 3304B.
 Curtel, G., 1836.
 Curtman, L. J., 750.
 Czadek, 1967.

D

Dafert, F. W., 876-877, 880, 882, 1880.
 Dagousset, 1897.
 Dahlem, J. P., 3220.
 Daish, Arthur J., 122-123, 371, 1641.

Dale, J. K., 136, 384.
 Damade, R., 3210.
 Damm, G., 686.
 Daniell, J. F., 20.
 Danilewski, 3354.
 Darabsett, D. B., 768.
 Daresté, 1875.
 Darrah, W. A., 2411.
 Dastre, A., 2656.
 Datta, Rasik, 776.
 Dauwe, Ferdinand, 723.
 Davanne, 2443.
 Davies, J. B., 787.
 Davis, Arthur L., 3341.
 Davis, Bernard F., 307, 314.
 Davis, Charles B., 2719.
 Davis, William A., 363, 371, 1503, 1641.
 Davison, F. R., 1922.
 Davison, W. C., 3148A.
 Davoll, David L., 3155.
 Day, F., 333.
 Decrock, E., 2080.
 Defren, George, 70, 77, 114–116.
 Defresne, T., 2789.
 Dehn, William M., 1264.
 Delarue, E., 47.
 Delaval, 3313.
 Delbrueck, 1578, 2472.
 Delemar, A., 3315.
 Delezenne, C., 3077.
 Delffs, W., 1133.
 Dellenbaugh, Anne G., 3200.
 Deltour, 1520.
 Demain, 2508.
 Demoussy, Em., 998.
 Denamur, 3251.
 Dennis, A. C., 2405.
 Denniston, Rollin H., 554, 561.
 Dennstedt, M., 1702.
 Denny, F. E., 1714.
 Denzer, L., 2441.
 Deprax, Paul, 1496.
 Deri, Wilhelm, 2494.
 Dernikos, Diamandi, 645.
 Derz, 2926.
 Des Bancel, J. Larquier, 3047.
 Desgréz, A., 2958.
 De Smet, 2825.
 Desmots, H., 3277.
 Desvergnés, Louis, 1863.
 Detmer, W., 2641, 2791, 2795.
 Deuel, Harry J., 800.
 Deutsche Diamalt Gesellschaft, 3444.
 Deutschland, A., 3131.
 Dewalque, F., 1770.
 Dhar, N. R., 957, 961, 1042.
 Dickmann, F., 1944.
 Dierssen, Heinrich, 83.
 Dieterich, Eugen, 2470.
 Dietrich, W., 2370, 2767, 3212.
 Dinanath, T., 2156.
 Dobell, H., 2637.
 Doby, G., 2720, 3048, 3417.
 Dodds, E. C., 3136, 3146.
 Dodel, Arnold, 547.
 Doeberiner, 652, 2375.
 Dollfus, E., 1021.
 Donaldson, Edwin R., 3148.
 Donath, E., 217, 700.
 Doroshevski, A. G., 95–96.
 Dott, D. B., 3115.
 Doumer, E., 788, 2753, 2759.
 Dowzard, Edwin, 1523.
 Dox, Arthur W., 1346, 1907, 1912.
 Dragendorff, 1572.
 Druyts, H., 1610.
 Dryerre, 3010.

Dubin, H., 750.
 Dubois, W. L., 1628–1629.
 Dubose, A., 1826, 2041.
 Dubourg, E., 3231.
 Dubrunfaut, A. P., 36, 142, 149, 184, 2593, 2598.
 Ducháček, F., 3137, 3423.
 Duckers, Grace E., 1299.
 Duclaux, E., 256, 282, 449, 548, 864, 3249.
 Duclaux, Jacques, 2679.
 Ducomet, H., 2121.
 Duell, Georg, 69, 231–232, 248, 252, 1599, 2042.
 Duering, A., 1651, 1788.
 Dugald-Campbell, 1999.
 Duggan, J. R., 2802–2803.
 Dulong, 437, 440, 993.
 Dumas, 437–438, 440, 993, 2170, 2416A, 2783.
 Duncan, W., 3120.
 Durandard, Maurice, 2700.
 Durieux, O., 1032, 3183.
 Duroy, J., 850.
 Durst, Gustav, 2568.
 Duryea, Chester B., 107, 124, 578, 2284.
 Dymond, 3154.
 Dyson, G. M., 2586A.

E

Eaton, B. J., 2115.
 Eaton, F. J., 953.
 Eberdt, Oscar, 546.
 Ebstein, Wilhelm, 2818.
 Eckart, Hanns, 1718.
 Eckenbrecher, C. von, 2043, 2056, 2060, 2062, 2065, 2067, 2072, 2090, 2096, 2101, 2105, 2122.
 Eckhard, M., 421.
 Eckhardt, F., 1510, 2649.
 Eder, Joseph, 677.
 Edson, H. A., 2123.
 Effront, Jean, 202, 212, 218–219, 225, 227, 1521, 1589, 2754–2755, 2817, 2819, 2822–2823, 2837, 2937, 3101, 3105, 3138, 3259, 3283–3284, 3308, 3342, 3389–3390.
 Egge, Walter A., 2125A.
 Egger, E., 1815.
 Egloffstein, 3178.
 Ehrecke, H., 1651.
 Ehrenberg, 1399.
 Ehrenreich, M., 3092.
 Ehrich, E., 372, 2760.
 Ehrlich, C., 289.
 Ehrmann, M. P., 1100.
 Eijkman, C., 3273.
 Eissler, Franz, 630–631.
 Ekhard, W., 137, 2364.
 Elion, H., 1471.
 Ellrodt, G., 3133, 3391.
 Elsdon, G. D., 1657.
 Ely, J. S., 2793.
 Embrey, G., 1824.
 Emmerling, O., 3072.
 Emslander, Fritz, 2682.
 Englis, D. T., 3433A.
 Epstein, Albert A., 941, 2927, 3333.
 Ericsson, Antipas, 1180.
 Eriksson, Elsa, 417, 615.
 Erlenmeyer, E., 3358.
 Ermen, W. F. A., 1309, 2500.
 Ernest, A., 1545.
 Ernström, Efr., 3054, 3060.
 Escales, R., 1095.
 Esch, Werner, 2404.
 Euler, Hans von, 391, 399, 411, 422, 943, 947–949, 2942, 3311, 3327, 3339, 3399.
 Evans, C. L., 354, 3161.
 Evans, G. T. R., 1391.

Eves, F., 2796.
 Ewell, E. E., 2044.
 Ewers, Erich, 1529, 1533-1534, 1540, 1558, 1630,
 1632.
 Ezendam, J. A., 2124.

F

Fabre, R., 400, 3139, 3213.
 Fahrenberg, 5.
 Falch, M., 385.
 Falk, K. George, 1908, 2948, 2950.
 Fall, C. B., 1434.
 Faltis, D., 814.
 Farcy, L., 1640.
 Farrow, Frederick D., 1287, 1325, 1327, 2569.
 Faulenbach, C., 1581.
 Faustner, 1725.
 Faxon, W. A., 73.
 Fay, Henry, 909.
 Feber, H., 281.
 Federer, B., 2289.
 Fehling, H., 1047, 1570.
 Feibelmänn, Richard, 2580.
 Fellenberg, Th. von, 1505, 1711, 2619.
 Fenger, Frederic, 2743, 2949.
 Fenton, H. J. H., 454, 707.
 Fermi, Claudio, 3069, 3234, 3243, 3280.
 Fernbach, Auguste, 117, 294-295, 318, 322, 326, 330,
 555, 724, 726, 1027, 1156, 1307-1308, 1358, 1362-
 1364, 1366, 1369, 1375, 1377, 2300, 2846, 2855,
 2879.
 Ferraud, 1003.
 Fesca, A., 2199.
 Ficinus, O., 2381.
 Fiehe, J., 1837.
 Field, Ellen, 926.
 Field, James John, 519.
 Fierz-David, Hans, 820.
 Filsinger, F., 1678.
 Findlay, Alexander, 802, 1249, 1256, 1262, 1274.
 Fine, Morris S., 3066.
 Fioroni, W., 642.
 Firth, James B., 803, 950.
 Fischer, Emil, 3381.
 Fischer, H. W., 1241.
 Fischer, Hugo, 552, 728, 2201.
 Fittbogen, 2026, 2203.
 Fitz, Albert, 3221-3222.
 Fleurent, 1741.
 Fleury, Paul, 3147.
 Flier, G. D., 3098.
 Flohil, J. T., 3203.
 Flory, Edgar L., 87.
 Flourens, G., 63.
 Flueckiger, F. A., 672, 1191, 1196.
 Fodor, E., 2939.
 Foerster, H., 2728.
 Foerster, Otto, 1145.
 Folth, 3264.
 Fonseca, da, 2977, 2991.
 Fontanello, Julia, 652B.
 Ford, John S., 315, 319, 2838, 2847, 2860, 3036, 3121,
 3446.
 Foret, 61.
 Fornet, A., 1840.
 Forster, R., 2447.
 Fosse, R., 1035, 1037.
 Foth, G., 1746, 1754, 2489.
 Fouard, Eugène, 562, 565, 567-569, 999-1000, 1002,
 1152, 1379-1381.
 Fouchet, A., 1627.
 Fowler, G. J., 2156, 2350.
 Fox, J., 3233.
 Fraenkel, Sigmund, 392, 2617, 2624.

Franchimont, A. P. N., 688.
 Francis, C. K., 572, 1345, 2113.
 Francke, G., 1582.
 François, L., 2313.
 Frank, G. H., 1901.
 Frank, Jos., 1245.
 Frank-Kamenetzky, A., 1626.
 Frankenbach, H., 1786.
 Frankforter, G. B., 462.
 Frankhauser, 59.
 Frankland, G. C., 3233.
 Frankland, P. F., 3233.
 Franz, Boh., 448.
 Frary, F. C., 2405.
 Fred, E. B., 3323.
 Frehse, 1890.
 Frei, August, 1780.
 Freiburger, M., 2403.
 Frère, J., 1040.
 Fresenius, H., 1735.
 Fresenius, R., 847, 1721.
 Fresenius, W., 1767, 1819, 1864.
 Freud, J., 2974, 2989.
 Freund, M., 2398.
 Frevert, H. W., 1297.
 Freytag, W., 879.
 Fricke, R., 2768, 2630-2631.
 Fricker, E., 3018A.
 Frickhinger, Hermann, 1576.
 Friedemann, W. G., 1913.
 Friedenthal, Hans, 908, 1223, 2614, 3118.
 Friedrichs, Oscar von, 119, 3298.
 Fries, L., 1584, 3112.
 Fritzsche, Julius, 509.
 Froelich, O., 2262.
 Fuchs, J., 276.
 Fuchs, Walter, 406.
 Fuerstenberg, M., 1872.
 Fuerth, 2476.
 Fuerth, Reinhold, 1288.
 Fues, Ernest, 2501.
 Funk, Eberhard, 2979.
 Funke, G. L., 2980.
 Fyfe, G. Matthew, 3214.

G

Gain, Edmond, 2685, 2869, 3039.
 Gaines, H. H., 2545A.
 Gair, D., 3180.
 Galeotti, G., 740.
 Galle, Ernst, 3343.
 Galli, Enrico, 3457.
 Garard, Ira D., 379, 1299, 2629.
 Gassicourt, de, 6.
 Gastine, G., 1171, 1828, 1831.
 Gathercoal, E. N., 2733.
 Gatin-Gruzewska, Z., 339, 364, 566, 573, 575, 577,
 1028.
 Gatterbauer, Jos., 108.
 Gaudechon, H., 1250.
 Gault, H., 1096, 1100.
 Gaultier de Claubry. *See* Claubry, Gaultier de.
 Gautier, Cl., 922.
 Gawalowski, A., 92, 1450.
 Gay-Lussac, 990.
 Gayon, U., 3231.
 Gebhard, Kurt, 2482.
 Geduld, Robert, 220.
 Gehlen, A. F., 7.
 Geinsperger, E., 1077.
 Geissler, E., 1812.
 Gélis, A., 2380.
 Gemmell, G. H., 2905.
 Genin, Alexander, 3108.

Gentile, J. G., 1441.
 Georgiyevsky, 167–168.
 Gerber, C., 1030–1031, 2884–2893, 2906–2908.
 Geromanos, H. W., 84.
 Gerum, J., 1504, 1909–1910.
 Gesell, Hermann, 2345.
 Gessard, C., 2861.
 Gessner, L., 1083.
 Gettler, A. O., 2710.
 Ghosh, S., 961.
 Giaga, 2845.
 Gianturco, E., 1687.
 Gies, William J., 1157.
 Gigon, A., 2862.
 Gill, Amos, 3316–3317.
 Gill, H. V., 2351.
 Gillis, J., 1426–1427, 1429.
 Gilson, E., 1891.
 Giltay, Anna, 1774.
 Gintl, W. Friedr., 2454–2455.
 Girard, A. C., 2429.
 Girard, Aimé, 1700, 1741, 2035–2036, 2121.
 Girardet, N. F., 3430.
 Girardin, 1797.
 Glaeser, M., 3173.
 Glann, Paul, 1220.
 Glaubitz, W., 3349.
 Glendinning, T. A., 235, 303, 1479.
 Glickmann, L. H., 2909.
 Glimm, E., 345, 3400.
 Goble, 1793.
 Goebel, H. E., 2848.
 Goettsch, Henry M., 910.
 Goldbeck, C., 1696, 2327.
 Goldmann, 1461.
 Goldschmidt, Harald, 3232.
 Goldstein, Kurt, 602, 646.
 Gombert, M., 1090.
 Gonnemann, M., 3378.
 Goodson, J. A., 2149.
 Goosen, G., 2330.
 Goppelsroeder, Friedrich, 855, 2004.
 Goralówna, C., 2774.
 Gore, H. C., 401, 2331, 2352, 3143, 3149, 3419, 3425.
 Goris, A., 2116.
 Gorodiski, Harald, 3000.
 Gorup-Besanez, von, 2595.
 Gosio, B., 3237.
 Gostling, Mildred, 454, 707.
 Gothe, F., 3409–3410.
 Gottstein, A., 967.
 Graber, Howart T., 2928.
 Grager, 2021.
 Graham, Thomas, 1192.
 Gramenizki, M. J., 3042, 3045–3046.
 Granger, 2021.
 Grasselt, H. M., 2369.
 Graumann, Erich, 1036.
 Graves, Sara S., 1344.
 Green, J. R., 2652, 3070–3071.
 Greenish, Thomas, 2007.
 Greifenhagen, W., 1497, 1541.
 Grélot, P., 1894, 1898.
 Griebel, C., 1719, 1838.
 Grierson, G. A., 228.
 Griessmayer, Viktor, 158, 171, 245, 542, 863.
 Griffing, E. P., 817.
 Grimbirt, L., 3197, 3201.
 Grimme, Clemens, 1552, 2144.
 Grimshaw, A. H., 3485.
 Griswold, W. L., 188.
 Gröb, Julius, 1257.
 Groll, J. Temminck. *See* Temminck Groll, J.
 Gross, Emanuel, 2063.
 Grossfeld, J., 1559, 1561–1562, 1565.
 Grosvenor, William M., 1258.

Grove, O., 3302.
 Gruber, D., 176.
 Gruenhut, L., 1767, 1864.
 Gruess, J., 2659, 2824.
 Grueters, Fritz, 86.
 Gruetzner, P., 165, 2831.
 Grundy, 520.
 Gschwaendler, 155.
 Gschwendner, B., 1623.
 Guaidukov, N., 1237.
 Guensberg, Rudolf, 1799, 2180.
 Guenther, Ludwig, 1737.
 Guérin-Varry, R. T., 145, 510–513.
 Guibort, 507, 653.
 Guichard, Petrus, 856, 1600.
 Guignet, C. E., 697.
 Guilliermond, A., 1854.
 Guradze, S., 2018.
 Gutbier, A., 1251.
 Guthrie, John M., 319, 2847, 2860, 3121, 3446.
 Guyatt, R., 3187.
 Guyenot, E., 2856.
 Guyton, 3216.
 Gyotoku, K., 3061.

H

Haarst, J. van, 3127.
 Haberlandt, G., 1858.
 Habermann, J., 1011.
 Haddock, Isaac T., 85.
 Haehn, Hugo, 1120, 1124, 2734, 2992.
 Haerdtl, H., 592.
 Haerz, E., 1025.
 Hager, H., 57, 1805, 1808–1810, 1816, 2456, 2459.
 Hagihara, Jitsuichi, 2993.
 Hahn, Amandus, 2736, 2959, 2981–2982.
 Hale, F. E., 455, 911–912.
 Halen, S., 1091.
 Hall, A. J., 3135, 3168, 3476.
 Hall, Thomas D., 2138.
 Haller, R., 1041.
 Hallgren, W., 951.
 Halmi, J., 2433.
 Hals, Sigmund, 1563.
 Hamburg, Max, 360, 2617, 3453.
 Hamburger, Carl, 2657.
 Hammerstein, F. O., 2339.
 Hanamann, J., 2032.
 Hanausek, T. F., 1814, 1849.
 Hanemann, L., 2267, 2273.
 Hannay, J., 2011.
 Hannig, Max, 820.
 Hanofsky, Carl, 1942.
 Hanow, H., 1959, 2268, 2270, 2274, 2277, 2282, 2285, 2288, 2290, 2292, 2295–2296.
 Hansen, J., 2370.
 Hansen-Bonn, 327.
 Harada, Ken, 412–413.
 Harding, Everhard P., 2125A.
 Harlan, H. V., 3416.
 Harman, H., 2119.
 Harper, R. A., 2139.
 Harper, W. J., 1667.
 Harpoder, Karl, 2736.
 Harrison, E. F., 3180, 3188, 3190.
 Harrison, William, 778, 923, 925, 1312.
 Hart, Merrill C., 2113A.
 Harter, L. L., 3334, 3346.
 Harting, P., 837.
 Harting, Th., 521, 531.
 Hartley, W. N., 193, 1210.
 Hartwich, C., 1498.
 Harvey, A., 1973.
 Harvey, E. H., 1293–1294.

- Harvey, R. B., 583.
 Harvey, S., 60.
 Harz, C. O., 907.
 Hasenbaeumer, J., 1242.
 Hasse, R., 309.
 Hasselt, J. F. B. van, 3418.
 Hastaden, E., 2485.
 Hata, S., 2872.
 Hatschek, Emil, 1300, 1317.
 Hatta, Zennoshin, 2933.
 Hattori, K., 423.
 Haupt, 1905.
 Hausman, L. A., 1430.
 Hawk, P. B., 2920, 3159.
 Hawkins, Lon A., 2921.
 Hay, G. M., 2138.
 Hayduck, M., 1446.
 Hebebrand, A., 1686.
 Hébert, Alexandre, 2098, 2271.
 Heesch, Karl, 1275.
 Hefelmann, Rudolf, 1951.
 Hefs, Eugen, 1413.
 Heger, Hans, 3450.
 Heggenhaugen, Sverre, 1563.
 Heide, 1747.
 Heidepriem, F., 1730.
 Heiduschka, A., 1855, 2332.
 Heimrod, Geo. W., 757.
 Heine, F., 2019, 2027.
 Heine, L., 257.
 Heinrich, F., 23, 3299.
 Heinricher, E., 1817.
 Heintz, L., 2721.
 Heinzelmann, G., 206, 334, 1595, 2660, 2664.
 Helbing, H., 3114.
 Held, Dirk, 1179.
 Helferich, Burckhardt, 1101.
 Helleberg, Karin, 411.
 Hembd, K., 2340.
 Henderson, James, 283, 702.
 Henley, F. R., 3328.
 Henri, V., 2681.
 Henry, O., 848.
 Herbert, Alexandre, 2098.
 Hérices-Tóth, I. V., 1499.
 Heritage, J. P., 2133.
 Herles, Franz, 1546.
 Herman, E., 1672.
 Herman, M., 1833.
 Heron, John, 178, 183, 221.
 Herschel, Winslow H., 1323.
 Herstein, B., 109, 1158.
 Herter, W., 1349, 1859.
 Herzberg, W., 2252.
 Herzfeld, A., 179, 185.
 Herzfeld, E., 386-387.
 Herzog, Maximilian, 2744.
 Herzog, R. O., 1270, 1276-1277.
 Hess, C. L. v., 3134.
 Hess, Kurt, 591.
 Hesse, Albert R. F., 3103, 3110.
 Heusch, Eugenio, 2910, 2922.
 Heyl, Frederick W., 2113A.
 Heyl, Rutger C: son., 355.
 Hibbard, P. L., 1604.
 Hickinbottom, W. J., 3319, 3328.
 Hiepe, W. L., 244.
 Higgins, 1148.
 Hilger, A., 1445, 1887.
 Hill, A. V., 346.
 Hill, Arthur C., 305.
 Hines, C. W., 2107.
 Hirschberg, A., 1170.
 Hirschfeld, Eugen, 2600.
 Hizume, K., 2769.
 Hockauf, J., 1829.
 Hodig, J., 2430.
 Hoefft, F. von, 581.
 Hoenig, Max, 887, 1065-1066, 1485, 1597.
 Hoermann, P., 1492.
 Hofer, A., 2399-2400.
 Hoffmann, J. F., 1236, 1955, 2091, 2102, 2105, 2107.
 Hoffmann, Wilhelm, 2099, 3300.
 Hoffmanns Stärkefabriken Aktiengesellschaft, 197.
 Hofmann, F. B., 1265.
 Hofmann, K. A., 712.
 Hofmeister, V., 3031.
 Holdefleiss, 1731.
 Holderer, M., 3094, 3096.
 Holmberg, Oskar, 402, 3011-3012.
 Holmes, A., 3411.
 Hooker, Henry D., 1919.
 Hoop, L. de, 403, 420, 479.
 Hopkins, D. G., 2589.
 Hoppe-Seyler, F., 673.
 Horn, J. S., 3309.
 Horton, Cecil L., 120.
 Horton, Edward, 1652.
 Horton, Horace E., 68, 2269.
 Horvat, V., 694.
 Hosaka, Y., 3050.
 Houdt, J. van, 1500.
 Hough, George J., 1183.
 House, Margaret, 2632.
 Howell, O. R., 1262.
 Hoyer, Otto, 1415.
 Huber, Adolphe, 2816.
 Hubert, L., 284.
 Hudson, Percy, 2658.
 Huebl, Jos., 1405.
 Huebner, J., 1869, 2570.
 Huefner, G., 162, 3357.
 Huenlich, 3469.
 Hueppe, F., 3025.
 Huerre, R., 340.
 Huggenberg, C., 1493.
 Huizinga, A., 1697, 2110.
 Hull, Mary, 2743, 2949.
 Hulpieu, H., 3018B.
 Hulton, H. F. E., 362, 390, 2114, 2749, 2858, 3207.
 Humbert, E., 848.
 Humphrey, H. C., 2317.
 Humphries, A. E., 3451.
 Hundhausen, J., 2272, 2275.
 Hurwitz, O., 636.
 Huss, Harald, 1352.
 Hussey, H. Neville, 2666.
 Husson, 865.
 Hutchinson, C. M., 3306.
 Hutchinson, H. B., 2483.
 Hutchinson, M. T., 2798.
- I
- Idles, H. A., 625.
 Ihl, Anton, 692, 695.
 Ilin, E. A., 3004.
 Iljin, W. S., 1123.
 Immerheiser, C., 3236.
 Ionescu, Al., 2960.
 Irvine, James C., 473, 480-481, 489, 500, 647.
 Isawa, Tamekichi, 2961.
 Isbert, A., 1467.
 Ito, Mitsujo, 3062, 3065.
- J
- Jackson, J., 1252.
 Jacobs, B. R., 1914.
 Jacobsen, H. C., 1968.
 Jacobson, C. A., 3411.

Jacoby, Martin, 979, 987, 2983.
 Jacquelain, 654.
 Jaekel, R., 1745.
 Jager, L. de, 2644, 2648.
 Jahn, R., 484.
 Jaloustre, L., 3083.
 Jalowetz, Ed., 258, 284, 320, 1886, 2513, 3401.
 Jancke, Willi, 1270–1271, 1276.
 Jaquelain, V. A., 146, 836.
 Jarman, A. J., 2486.
 Javillier, M., 3335.
 Jayson, Alfred R., 128.
 Jean, Ferdinand, 3260.
 Jeffers, E. H., 1539.
 Jencic, S., 1161.
 Jensen, B. C. P., 2770.
 Jentys, E., 563.
 Jernakoff, C., 1121–1122.
 Jessen, Carl, 530, 1188, 1190, 1195.
 Jetter, Wilhelm, 3395.
 John, S.
 John, O., 2811.
 Johnson, Arnold H., 2587.
 Johnson, Harold, 74.
 Johnson, T., 2140.
 Johnson, W. A., 2924, 3124.
 Jonas, L., 833.
 Jones, E. W. T., 1590.
 Jones, G. C., 3184.
 Jones, W. Neilson, 821.
 Jong, H. G. Bungenberg de, 1329.
 Joscht, A., 2941.
 Josephson, K., 399, 1658.
 Joszt, Adolf, 1393–1394, 3434.
 Juillet, Armand, 2086.
 Jumper, Charles H., 87.
 Jungk, J. F., 3111.
 Junk, A., 1184.

K

Kabsch, W., 1136.
 Kaiser, Albert, 1704.
 Kaja, P., 2630, 2768.
 Kalberer, O., 1923.
 Kalinowsky, J. v., 655, 1048.
 Kalning, H., 1915.
 Kalt, H. P., 1451.
 Kamenetzky, A., 1626.
 Kamm, Oliver, 1647–1648.
 Kano, N., 1186.
 Karrer, Joanne L., 3336.
 Karrer, Paul, 469–470, 474–476, 482–483, 490–491, 501, 634–637, 639–643, 1097.
 Katayama, M., 919.
 Kattein, A., 709, 714, 1226.
 Katz, J. R., 764–765, 771–772, 1289.
 Kaufmann, d'Alfort, 3367.
 Kaufmann, W. P., 2310.
 Kaufmann, Wilhelm v., 973–974, 980, 987.
 Kaulfersch, Ferdinand, 1508.
 Kebler, Lyman F., 1606.
 Keener, O. S., 1699.
 Kehoe, Robert A., 2962.
 Keitt, T. E., 2092.
 Keller, Wilhelm, 207.
 Kellersberger, E., 3130.
 Kellner, O., 1879, 2812.
 Kemper, R., 666, 857.
 Kempton, J. H., 1916.
 Kendall, E. C., 2880, 3191.
 Kende, Siegmund, 2943.
 Kerb, Johannes, 1088.
 Kerstjens, A. H., 1085.
 Kessler, K., 1092.

Kette, W., 2217.
 Kette-Jassen, M., 2025.
 Kickton, A., 1491.
 Kiliana, H., 456.
 Kindt, 1051.
 King, George, 1249, 1256.
 King, J., 1301.
 Kirchdorfer, Fr., 2546, 2556.
 Kirchhoff, G. S. C., 1, 140, 2163.
 Kirschner, Max, 404.
 Kita, Genitso, 2994, 3294, 3301, 3312.
 Kitayama, 3215.
 Kittlausz, 2056.
 Kjeldahl, J., 166.
 Klason, Peter, 502.
 Klauss, A., 44.
 Kldiaschwili, A. G., 1074, 1076.
 Kleemann, Andreas, 3182.
 Klein, 328.
 Klemen, R., 623.
 Klempin, Paul, 3038.
 Klepatschewsky, 2391.
 Klinger, R., 386–387.
 Kloss, R., 2702.
 Knab, Oscar, 866.
 Knaffl-Lenz, E. von, 1077.
 Knecht, Edmund, 794.
 Knight, Nina, 822.
 Kobert, R., 2495.
 Koch, G. P., 3307, 3414.
 Koechlin, Karl, 1926.
 Koenig, Adolf, 2638, 3052.
 Koenig, F. Josef, 1242, 1492, 1605, 1776.
 Koenig, J., 1541.
 Koenig, R., 2518.
 Koester, Hans, 1101.
 Kofler, Ludwig, 2126.
 Koga, Torao, 2995, 3426–3427.
 Kolbach, P., 3153, 3209, 3212.
 Kolthoff, I. M., 940, 944, 1506, 1513.
 Koning, C. J., 3128–3129.
 Kopp, Ch., 2237.
 Kopper, A., 733.
 Korschelt, O., 3223.
 Kosmann, C., 3359.
 Koudelka, V., 2514.
 Kozai, Y., 3268.
 Krabbe, G., 2651.
 Kraemer, Henry, 553, 1417.
 Kraus, Paul, 3445.
 Kramer, Ernst, 2015.
 Kramm, L., 2052.
 Kratschmer, F., 1447.
 Krauch, C., 1878, 3361.
 Krause, A., 3017.
 Krauss, F. G., 2353.
 Kraut, Heinrich, 3106.
 Krauze, L., 2692.
 Kreibich, 2093.
 Kreis, Hans, 1778.
 Kreusler, U., 877.
 Kreuzer, C., 1709.
 Krieger, Josef, 1677, 2263, 3033.
 Krizkousky, F. L. P., 2588.
 Krizkovsky, O. K. A., 2362.
 Krockner, 1873, 1991.
 Kroetke, C., 39.
 Krueger, Fritz, 2479.
 Krug, William H., 1477, 1607, 1768.
 Kruijff, E. de, 2297, 3281.
 Kruijff, H. W. de, 1772.
 Kruis, K., 208.
 Kruyt, H. R., 1295, 1332.
 Krzemeckii, A., 2692.
 Krzymowski, Richard, 2066.
 Kodo, T., 2686.

Kuebel, F., 2828.
 Kuehl, H., 1972.
 Kuchne, Otto, 1979.
 Kuchne, Walter, 1979.
 Kuelz, E., 259.
 Kuennmann, O., 1887.
 Kuerschner, Karl, 1302.
 Kuester, Fritz W., 897, 902.
 Kuhn, Richard, 414-415, 424.
 Kunz, Eduard, 125.
 Kunz-Krause, Hermann, 804.
 Kusenack, W., 612.
 Kutscha, Richard, 1783.

L

Laborde, 3081, 3255.
 Ladd, E. F., 1881.
 Laer, Henri van, 100, 344, 350-353, 357-358, 389, 564, 2711, 2919, 3044, 3145, 3251.
 Laer, J. A. van, 420.
 Lagane, L., 2923.
 Lagerheim, G., 1825.
 Lalin, L. M., 1633.
 Lamb, M. C., 1973.
 La Mer, Victor K., 2629.
 Lampadius, W. A., 24, 144.
 Lampe, B., 3140.
 Landergren, Sture, 948.
 Landwehr, H. A., 1457.
 Lang, H., 2963.
 Lang, S., 2694, 2963.
 Lang, Viktor V., 1404.
 Langbein, Georg, 1010.
 Langbein, H., 1216.
 Lange, G., 3166.
 Lange, H., 1685, 2082, 2200, 2701, 3383.
 Langhans, Alfred, 629.
 Langley, J. N., 2796.
 Langwell, Herbert, 3343A.
 Langworthy, C. F., 2118.
 Lapidus, Herman, 2894.
 Larue, Pierre, 2323.
 Laskowsky, W., 2346.
 Lasnitzki, A., 811.
 Lassaigne, J. L., 147-148, 831, 834, 838, 2376, 3024.
 Lassmann, Max, 1093.
 Lászlóffy, Aladár von, 2839.
 Laurent, 2314.
 Law, Douglas J., 1080.
 LaWall, Charles H., 1344, 1606, 2557.
 Lea, A. S., 213.
 Leathes, J. B., 1278.
 Lebeau, P., 812.
 Lebedew, A., 2684.
 Leberle, 2068.
 Leclerc, A., 1676.
 Leclerc du Sablon, 1890A, 1891A.
 Leconte, E., 2293.
 Lecoq, Raoul, 2771, 3055, 3063, 3067.
 Leffmann, Henry, 2807.
 Lehmann, F., 1635.
 Lehmann, P., 1547.
 Lehrman, Leo, 626.
 Leibowitz, Jesaia, 427, 504, 612, 648, 650.
 Lemay, 3081.
 Lenz, Wilhelm, 1839, 1841-1842.
 Lenze, Friedrich, 1070.
 Lenze, Käthe, 1564.
 Lepeschkin, W. W., 1290-1291.
 Leroy, 832.
 Leuchs, E. F., 3350.
 Leuchs, G., 3355.
 Leuchs, Joh. Carl, 22.
 Leulier, A., 1162.
 Leuscher, E., 2057.
 Levberg, 167-168.
 Levites, S. A., 1341.
 Levy, David J., 3091.
 Levy, H., 1095.
 Lévy, Lucien, 1365.
 Lévy, M. L., 3256.
 Lewis, S. J., 1281.
 Lewis, W. K., 1259.
 Lewite, A., 980, 987.
 Lichtenstein, Stefanie, 633.
 Lieben, Ad., 1012.
 Liebig, H. J. von, 3402.
 Liebig, Justus, 1008.
 Liechti, L., 1062.
 Liesegang, 2445.
 Lietz, O., 1615.
 Limbosch, H., 2868, 3041.
 Lindenmeyer, G., 1929.
 Linder, S. Ernest, 1215.
 Lindet, Léon, 209, 556, 718, 1514, 1527, 1613, 1682, 1743, 3385.
 Lindner, Paul, 795, 1428, 3292, 3295.
 Lindner, Rudolph, 2333, 2341.
 Linebarger, C. E., 1214.
 Ling, Arthur R., 260-261, 277, 306-307, 310-314, 347, 425, 458, 492, 606, 616-617, 1660, 1667, 2826, 2829, 2863, 3175, 3189, 3403.
 Lingelsheim, A., 1850.
 Lintner, Carl J., 67, 69, 198, 203, 214-215, 222, 230-232, 234, 246-248, 250-252, 262-264, 451, 1014, 1338, 1462, 1531, 1535, 1542, 1599, 1769, 2028, 2616, 2642-2643, 2649, 2761, 3030, 3156, 3172, 3186, 3363.
 Lippmann, Edmund O. von, 2672.
 Lippmann, Eduard, 1336.
 Lippmann, Friedrich, 72, 2396.
 Lisbonne, Marcel, 1385, 2895-2897, 2911, 3077.
 List, P., 2558.
 Littleton, Fannie T., 1703.
 Ljubavin, N. N., 1355, 2392, 2653.
 Lloyd, Hoyes, 741.
 Lloyd, L. L., 2547.
 Loeb, L. Farmer, 811.
 Loeb, Walther, 751, 1386, 2621, 2723.
 Loeper, M., 3019.
 Loew, O., 670, 2601, 2639, 2808.
 Loewenthal, S., 3074.
 Lohmann, A., 3441.
 Lombroso, Ugo, 3049.
 Long, J. H., 2924, 2929.
 Long, W. S., 1710.
 Longard, C., 968.
 Lonnes, Carl, 898.
 Lorber, Leo, 3150.
 Lorenz, A. W., 935.
 Lorinser, 3056, 3064.
 Loth, Willi, 2687.
 Lott, Frank E., 576, 2053, 2658.
 Lottermoser, A., 915, 945, 952, 958.
 Lowartz, Carl, 2737.
 Lowe, G. M., 1325.
 Lucks, R., 1910A.
 Ludewig, Stephan, 956.
 Luedeking, Ch., 1207, 1212.
 Luedersdorff, 143, 1437.
 Lüers, Heinrich, 396, 1670, 3013, 3056, 3064, 3107.
 Luehder, E., 2073.
 Luehrig, H., 1566, 1982.
 Luger, Alfred, 2938, 2964.
 Lumière, Auguste, 937.
 Lunn, A. H., 3343A.
 Luna, Ramón, 1993.
 Lunge, George, 675.

Lunt, H. A., 3433A.
Lutz, Alfred, 2481.
Lyalin, L., 2689.

M

McBain, J. W., 2589.
McCurdie, T., 2365.
MacDonald, J. W., 2228.
MacDonald, John, 647.
McDonnell, C. C., 2301.
Macfarlane, Thomas, 1473.
McGuigan, Hugh, 381, 3134.
McGuire, G., 2948, 2950.
Mach, 1553.
Machida, E., 3215.
McLaren, G., 2863, 3403.
MacMichael, R. F., 1319.
MacNider, G. M., 1314-1315, 1321, 2515.
Macquaire, P., 365.
Maeda, Kiyomitsu, 3431.
Maercker, M., 172, 175, 1587, 1734, 1756, 2013, 2020-2021, 2030, 2419.
Maestrini, Dario, 393, 2738, 2745-2746, 2762, 3051, 3057.
Magerstein, Th., 1407, 3132.
Maggi, Harry, 975, 977-978, 981, 986.
Magnes-Lahens, 839-840.
Magnus-Levy, 2473.
Maicha, 2195.
Maige, A., 610.
Maignon, F., 2772, 2775.
Makrinov, I. A., 3305.
Malaguti, F., 1794.
Malfitano, G., 557, 601, 607, 618, 752-753, 758-759, 1383-1384.
Mallat, A., 1452.
Mallée, A. M., 1744.
Mallet, J. W., 1211.
Malvin, V., 2570.
Manaresi, Angelo, 1777.
Mangin, L., 3344.
Mann, Albert, 3416.
Mann, William A., 1280.
Mannich, C., 1564.
Maquenne, Léon, 323-324, 405, 558, 570-571, 719, 1357, 1359, 1361, 1366-1368, 1370-1371, 1956, 2849-2850.
Marbach, Adolf, 3265.
Marc, Robert, 761, 1246.
Marcano, V., 689, 3226-3227.
Marcet, F., 2377.
Marchand, E., 1802.
Mark, van der, 1596.
Margival, F., 2496.
Marke, A., 1732.
Marozeau, 1790.
Marr, F. S., 2483.
Marshall, A., 2571.
Marshall, John, 3097.
Marsiglia, T., 1176.
Martens, P., 1306.
Martin, A. G. C., 1400.
Martin, Émile, 2167A.
Martin, Sidney, 2809, 2813.
Martin, W. E., 3026.
Marx, Th., 1310.
Masche, O., 517, 658.
Massol, L., 742, 754.
Masuyama, M., 3384.
Maszewski, T., 299.
Mathieu, 141.
Mathieu, L., 1153.
Matthews, Charles G., 329, 576, 1481, 2053, 3141.
Matthiae, Rudolf, 2325.

Mattill, Helen I., 755.
Matzdorff, 1979, 2085.
Mauban, H., 3204.
Mauch, Richard, 1342.
Maumus, 3248.
Maurin, E., 3083.
May, R. J., 3452.
Mayer, Anka, 597-599, 603, 988.
Mayet, 1795.
Mayrhofer, Joseph, 1475, 1483, 1486, 1679-1680.
Maxwell, L. A. I., 367.
Mazoué, B., 3076.
Mecklenburg, 760.
Medicus, L., 1577, 3236.
Mège-Mouriès, 3353.
Mehta, M. M., 1871B.
Meineke, C., 899.
Meissner, Franz, 1209.
Meldolesi, Gino, 392, 394.
Mellanby, John, 789, 2930.
Melsen, 523.
Mendel, L. B., 3394.
Menke, Albert E., 1739.
Menter, Franz, 1077.
Mérimeé, 2436.
Mering, von, 180, 186, 189, 3360.
Merkatz, A. M. von, 2735.
Métillon, 1530.
Meunier, J., 1484.
Meusel, E., 1337.
Meyer, Arthur, 223, 536, 541, 543, 549, 580, 679, 684, 867.
Meyer, D., 2851.
Meyer, Hugo, 2982.
Mez, Carl, 2282A.
Mialhe, 2592.
Michael, A., 1063.
Michaelis, Leonor, 2688, 2931, 3092, 3095.
Michalik, Rudolph, 2959.
Miche, Hugo, 2763.
Mikawa, Yoshiyuki, 3014.
Mikrosch, K., 544.
Milkowski, Z., 1763.
Millar, J. H., 273-274, 287-288, 1071, 1221, 1617.
Miller, R. J., 1185.
Minaeff, M., 613.
Minami, D., 2912-2913.
Minchin, A. L., 3199.
Miner, C. S., 113.
Mirescu, J., 960A.
Mitchell, C. A., 3176.
Mitscherlich, Alfred, 2141.
Mitsui, Ito, 3062, 3065.
Mittelmeier, Hans, 66, 265, 278, 444-445, 447.
Miura, Soichiro, 1029.
Miyake, Koji, 3062, 3065.
Miyake, Suguru, 1920.
Moerk, Frank X., 1174.
Moeser, Ludwig, 1971.
Mohl, Hugo von, 525.
Mohr, Otto, 335, 1169, 2702, 2832-2833, 2842, 3292.
Mohs, K., 2739.
Moissan, Henri, 703, 1015.
Mollino, A., 2559.
Monheim, C., 1463, 1760.
Monier, E., 1440.
Monnier, M. A., 3194.
Moog, R., 2958.
Moore, Charles C., 2069, 2083, 2347.
Moore, William, 9.
Moore, Wm. C., 787.
Moraczewski, W. von, 2827.
Morawski, Th., 3173.
Moreau, Edmond, 3192, 3406.
Moreau, J., 313.
Morgen, A., 1733-1734.

Mori, Gensichi, 2996.
 Mori, Y., 2812.
 Moritz, E. R., 216, 235, 2804-2806, 3371.
 Morningstar, Joseph, 2407.
 Morris, G. Harris, 196, 211, 224, 236, 254-255, 273-274, 301, 443, 708, 1221, 3250, 3368, 3374, 3377.
 Morris, Leslie E., 823.
 Morrison, F. R., 2160.
 Mosca, F. Traetta, 3407.
 Moschkoff, A. N., 752-753, 758-759, 1383-1384.
 Mose, W. L., 3478.
 Moskowitz, M., 1324, 1326.
 Moucka, F., 3470.
 Moufang, Ed., 2914.
 Mougeot, A., 3019.
 Mrotschkovsky, J., 2814.
 Muehlhaeuser, O., 1067.
 Mueller, Alex., 1137, 1144.
 Mueller, Arthur, 1234.
 Mueller, Eduard, 3157.
 Mueller, Johannes, 3384.
 Mueller, Max, 3035.
 Mueller-Thurgau, Hermann, 3027.
 Muenther, F., 2851, 3291.
 Muenther, Julius, 4, 514.
 Muentz, A., 3218.
 Muhleman, G. W., 2929.
 Mulder, E., 2782.
 Mumford, N. V. S., 134.
 Munk, J., 2786.
 Munsche, Albert, 253, 1602.
 Munsterman, C. A., 3144.
 Murdfield, R., 1491.
 Murray, H. D., 962.
 Musculus, Fritz, 32, 37, 51, 150, 153, 176, 180, 186, 533, 671, 679, 684, 1140, 1202, 3360.
 Musgrave, A. F., 3462.
 Musset, Franz, 704, 905.
 Muter, 1877.
 Mutnianski, M., 1172.
 Muttelet, C. F., 1642.
 Myers, Rollin C., 2731.
 Myers, Victor C., 1653, 3200.
 Mylius, F., 883-884, 903.
 Myrbaeck, Karl, 422, 943, 949.

N

Naegeli, C., 634-636.
 Naegeli, Carl W., 474, 522, 524, 526-529, 532, 535.
 Nagao, Y., 348.
 Nagaoka, M., 2812.
 Nagel, 1509.
 Nagel, C., 1975.
 Nakamura, Yukihiko, 807, 1871C.
 Nanji, Dinshaw R., 425, 606, 616-617, 1667.
 Nash, E., 2170A.
 Nasse, Otto, 173, 2785, 3032.
 Nasse, Wilh., 139.
 Naudain, G. G., 824, 1433.
 Naudin, 1059.
 Naylor, N. M., 2632, 2986, 3022.
 Neale, S. M., 1296.
 Neger, F. W., 1844.
 Neidig, Ray E., 3412.
 Neill, A. J., 2747.
 Neilson, C. Hugh, 727.
 Nelson, John M., 587, 593.
 Nessler, J., 1444, 2184.
 Neuberg, Carl, 734, 1029.
 Neuffer, W., 160.
 Neumann, Fr., 1625, 2070, 2074.
 Neumann, Hans, 2161.
 Neumann, M. P., 1851, 3447.

Neumann, O., 1773.
 Neun, D. E., 2628.
 Newkirk, W. B., 137A.
 Niebel, W., 3381.
 Niepce, 660, 662.
 Nishiwaki, Y., 3346A.
 Nitykowski, 2022.
 Nivling, Walter A., 2561, 2582.
 Nobbe, Friedrich, 1443, 2001, 2033.
 Nogier, Th., 922.
 Noguchi, Y., 3428.
 Norris, James F., 909.
 Norris, Roland V., 3429.
 Northrop, John M., 587, 3318.
 Nossian, Wilhelm, 1193.
 Nothnagel, M., 1719.
 Nottin, P., 1514, 2366.
 Novikow, A. S., 3003.
 Nowak, C. A., 3198.
 Noyes, William A., 87.
 Nussbaum, Josef, 1033.
 Nyman, Max, 1343.

O

Obermann, Richard F., 1453.
 Oechsner de Coninck, W. See Coninck, W. Oechsner de.
 Oeser, E., 1103.
 Oesper, Ralph E., 128.
 Ohhashi, J., 3061.
 Ohlsson, Erik, 2756.
 Ohlson, L. William, 1243, 1253.
 Okada, Takeo, 2988.
 Okazaki, K., 3285.
 Oldham, J. W. H., 473, 500.
 Olsen, Aksel G., 3066.
 Olson, George A., 1634.
 Olsson, Urban, 2965-2966, 2997, 3169.
 Oosthuizen, J. du P., 3408.
 Oparin, A., 3432.
 Ortvad, W. C., 3296.
 Osborne, Thomas B., 2606, 2608-2609.
 Oshima, Kokichi, 3205, 3331, 3345.
 Ossendousky, A. M., 3282.
 Ost, H., 316, 450, 1083.
 Ostwald, Wilhelm, 713, 2510.
 Ostwald, Wolfgang, 1333-1334.
 O'Sullivan, Cornelius, 161, 169-170, 181, 1585, 337.
 O'Sullivan, James, 317, 388, 1495, 2038.
 Osztróvsky, A. v., 1499.
 Ott, Emma, 1224.
 Otto, 2153.
 Ozawa, Takeshi, 2150.

P

Padoa, M., 916, 920, 1271.
 Paine, H. H., 1391.
 Painter, H. M., 2801.
 Painter, W. J., 1187.
 Palewski, Br., 2661.
 Palit, C. C., 1042.
 Pammel, L. H., 1907.
 Pannetier, A., 1464.
 Pantanelli, E., 2127, 2135.
 Panzer, Theodor, 2696, 2703-2708, 2713-2714, 2727.
 Paraf, Mathias, 3438.
 Pariset, 3185.
 Parker, A. Hyde, 1481.

Parow, Edmund, 89, 129, 1168, 1239, 1431, 1619, 1625, 1784-1785, 1834, 1963, 1969, 1976, 1983, 1985-1986, 2064, 2070, 2074, 2084-2085, 2088, 2128, 2151, 2298, 2305-2307, 2321, 2334, 2342, 2348, 2354, 2359, 2363, 2401, 2434, 2502, 2573-2574.

Passmore, F. W., 3114.

Pastore, Salvatore, 2740.

Patai, Joseph A., 3303.

Pauletig, Marius, 375.

Paulsen, W., 2040, 2048, 2051.

Pawlewski, Br., 2661.

Payen, A., 34, 154, 515, 652A, 661, 663-664, 858, 860, 991-992, 994, 1052, 1126, 1335, 1442, 1800, 1924, 2170, 2416A, 2594, 2635, 3437.

Payne, J. M., 805.

Payr, Heinrich von, 1130.

Peckstein, H., 2931.

Pekarskaya, G. F., 2726.

Peklo, Jaroslav, 1895.

Pellet, H., 75, 861, 875, 1482.

Pellet, L., 1530.

Pelouze, J., 1009, 1049-1050, 2170, 2416A.

Pénau, H., 400, 3139, 3213.

Perdrix, L., 3244-3245.

Perewosky, Rahel, 3108.

Perger, Hans, 133.

Perkin, A. G., 1901.

Pernossi, Leoni, 3069.

Perret, E., 2596.

Perrier, G., 1627, 1640, 1921.

Perry, E. E., 818.

Persch, Walter, 638, 644.

Personne, J., 852, 859, 868.

Persoz, J., 25-26, 29, 652A, 1924, 3437.

Peschechonow, 2784.

Peskov, N. P., 3085.

Petermann, A., 2039.

Peters, Amos W., 2873, 3093.

Peters, August, 3458.

Peterson, W. H., 2145, 3323.

Petit, A., 164, 862.

Petit, Paul, 269, 279, 290, 296, 426, 825, 1017, 1612, 2394, 2525, 2667, 2674-2676, 2678, 2725.

Petrunkin, M. L., 2998.

Petzoldt, H., 3029.

Pfaff, 10.

Pfeiffer, E., 2797.

Pfeiffer, Th., 997.

Pflugradt, A., 3448.

Phelps, Isaac K., 619.

Philia, M., 410, 1871, 3104.

Philipp, Otto, 35.

Philippe, M., 1236.

Phillippe, J. Giordano de, 2000.

Philoché, C., 336-337.

Piccinini, Guido, 3020.

Pickard, R. H., 2526.

Pickering, Spencer U., 275, 1811.

Pictet, Amé, 465-467, 471, 477, 484-485, 494-495, 499, 503.

Pictet, Jacques, 477.

Picton, Harold, 1215.

Pieraerts, J., 1549, 2103.

Pierozek, S., 3126.

Piettre, Maurice, 1693.

Pinchon, A., 1882.

Pincussen, Ludwig, 2999, 3082, 3086-3089.

Pinnow, J., 913.

Pisani, F., 846.

Planchon, Louis, 2086.

Planowsky, N. J., 2562.

Planta, A. von, 3358.

Poggendorff, J. C., 439.

Pohl, J. J., 853, 1722, 1796.

Polenske, Eduard, 1690.

Pollak, Alfred, 3179, 3386.

Pollak, Isidor, 3442, 3463.

Pollieri, Pio M., 2757.

Pollitz, 1182.

Pomeranz, H., 1164, 2539-2540, 2548, 2563.

Porst, Christian E. G., 118, 130, 134, 1324, 1326, 1550-1551, 1554.

Portele, K., 2031.

Porter, A. E., 2690.

Possetto, G., 1821.

Pott, E., 2010.

Pottevin, Henri, 286, 291-293, 297.

Poucher, W. A., 2335.

Power, F. B., 2157.

Pozerski, 2669.

Pozzi-Escot, Emm., 1694, 3274, 3278.

Preckel, F., 2102, 2108.

Pregl, Fritz, 1072.

Prescher, Johannes, 1980.

Freti, L., 2857.

Preuss, E., 88, 1755, 1989A, 2490.

Pribram, Ernst, 2622.

Price, D. J., 2367.

Price, T. M., 1638.

Price, W. J., 1660.

Pringsheim, Hans, 406-407, 416, 427, 463, 486, 496, 504, 602, 611-612, 629-633, 638, 644-650, 826-826A, 1093, 2735, 3000, 3108.

Prior, Eugen, 237, 270-271, 298, 2677.

Prout, William, 435.

Puchot, E., 871.

Puckner, W. A., 3449.

Pugliese, Angelo, 3034.

Punnett, P. W., 373, 2697.

Puriewitsch, K., 1412.

Puscher, C., 1798.

Q

Quinan, Clarence, 2874.

Quincke, G., 1229-1230.

Quisumbing, Francisco A., 1649.

R

Raab, L., 2005.

Racke, O. C., 3483.

Rachlmann, E., 1231.

Rakovski, Adam V., 95-96, 743-746, 756, 762, 766, 773, 1004-1006.

Rakuzin, M. A., 779, 2726, 3098-3099.

Ramayyar, C. S., 3306.

Rapp, Rudolf, 3263.

Rask, Olaf S., 619, 1328, 1353, 1914.

Raspail, 505-506, 508.

Raumer, Ed. von, 91, 1601, 3235.

Ravizza, Vittore, 1318.

Raynaud, A., 97, 101-106.

Reaburn, 2535.

Rechenberg, C. von, 680, 1205.

Reed, J. O., 401.

Reed, Lester, 1708.

Reese, H. C., 401.

Regnard, P., 2792.

Rehwal, F., 2223.

Reichard, Albert, 971, 2075.

Reichard, C., 1751.

Reichardt, 1012.

Reichert, Edward Tyson, 342, 1419-1420, 1424.

Reichl, C., 681.

Reilly, Joseph, 3319, 3328.

Reimann, M., 2451.

Reiners, A. H., 2590.
 Reinhardt, C., 881.
 Reinitzer, Friedrich, 2662, 3369, 3404.
 Reinke, J., 2014.
 Reinke, Otto, 1591, 1598, 1947, 1962, 2250, 2528, 3246.
 Reinsch, Hugo, 851, 1053, 1194.
 Reischauer, C. G., 152.
 Reissek, 516.
 Remington, Roe R., 1906.
 Rempel, R., 1456.
 Renaud, A., 3142.
 Rendle, Theodore, 3403.
 Renk, A., 2421.
 Renzo, Francesco di, 3086.
 Retez, L., 2564.
 Reuss, A., 1422.
 Revis, Cecil, 1643.
 Rey, Lucian, 2379.
 Reyckler, Albert, 472, 596, 1001, 1038, 1350-1351, 1389-1390, 1432, 1435, 2645-2646.
 Rheinfels, C., 325.
 Riban, J., 678.
 Richard, 426.
 Richard, D., 2503.
 Richard, L., 1586.
 Richards, A., 3080.
 Riche, Alf., 2208.
 Richter, G. M., 2463.
 Rideal, S., 1885.
 Riechelmann, 1567.
 Riedel, A., 2510.
 Riedel, J. D., 3195.
 Riehl, M., 343.
 Riemer, Karl, 356.
 Rienke, Otto, 2528.
 Riesenbergh, H., 1515.
 Rigaud, M., 1555.
 Rinaldini, Theofilo, 2915, 3405.
 Ringer, W. E., 2916.
 Ripperton, J. C., 2146.
 Rischbieth, P., 696.
 Ritter, Franz, 1056.
 Rivat, Georges, 924.
 Rivot, 1403.
 Roard, 2372.
 Roark, G. W., 1346.
 Roberts, C. F., 900.
 Roberts, Charles C., 1902.
 Roberts, William, 3153A.
 Robin, Lucien, 1624.
 Robinson, F., 738.
 Robinson, Guy C., 3340.
 Robiquet, 437.
 Rockwood, Elbert W., 2944, 2951, 3015.
 Rodewald, Hermann, 709, 714, 1218, 1222, 1226-1227.
 Rodnar, J., 3417.
 Roeder, Georg, 3208.
 Roehmann, F., 238, 249, 376, 3375.
 Roessing, Adelbert, 90, 1487, 1489-1490, 1620.
 Roger, H., 2864-2866.
 Rohland, 2431.
 Rohonyi, Hugo, 349.
 Rolants, E., 2425, 3252.
 Rolfe, George W., 70, 73, 77, 84-85, 1966.
 Romilly, 2444.
 Rommel, W., 3269.
 Rona, Elisabeth, 2741.
 Rona, P., 3095.
 Roncato, A., 959.
 Ronzin, N., 613.
 Rosebourne, C., 802.
 Rosenberg, J. O., 482.
 Rosenberg, T., 2862.
 Rosenblum, Edward I., 3206.

Rosenhek, J., 55.
 Rosenstiehl, E., 1644.
 Rosenthal, Eugen, 3303.
 Rosenthal, J., 729.
 Rosenthaler, L., 620, 813, 2691.
 Ross, J. H., 410, 485, 805, 1871.
 Roth, E., 2432.
 Rothenbach, F., 3253.
 Rother, S., 1197.
 Rother, W., 550.
 Rothlin, E., 1113, 1115-1117.
 Rotondi, Ermenegildo, 2229.
 Rousseau, E., 962A.
 Rouvier, E. Gaston, 891-893, 895-896, 901, 904, 905.
 Roux, Eugène, 321, 324, 558, 1356, 1370-1374, 1375, 2849-2850.
 Row, T. L., 2137, 2932.
 Rözsényi, Iván, 1832.
 Rubeln, M., 2349.
 Rudolf, 1951.
 Ruediger, 1748.
 Ruef, E., 2511, 2551.
 Rueha, Amin, 2978.
 Rumsey, Louys A., 3477.
 Rupp, E., 1635.
 Russ, S., 739.
 Rusting, Gullow, 1892.
 Ryan, J. G., 3398.

S

Saare, Oscar, 76, 82, 1306, 1736, 1738, 1742, 1931, 1943, 1945-1946, 1952-1953, 2029, 2049, 2214, 2218-2219, 2224-2225, 2230-2231, 2238-2239, 2241-2247, 2251, 2253-2256, 2264-2265, 2276, 2278-2280, 2286, 2395, 2424, 2474, 2477.
 Sabalitschka, Th., 1515, 2776-2777, 3109.
 Sachsse, Robert, 1575.
 Sadtler, S. S., 1087.
 Saiki, Tadasu, 3392.
 Saito, K., 3279, 3286.
 Salecker, P., 3447.
 Sallinger, Hermann, 790, 982, 987, 1106, 1388.
 Salomon, F., 45, 48-49, 52, 1580, 2209.
 Salter, J. H., 551.
 Salzmann, Rachel, 495, 503.
 Samec, Max, 382, 478, 493, 581, 584, 588, 592, 599, 603, 613, 621-623, 747, 767, 797, 988, 1163, 1316.
 Sammartino, Ubaldo, 2967.
 Sande-Bakhuyzen, H. L. van de. See Bakhuyzen.
 H. L. van de Sande.
 Sandera, K., 1303.
 Sandras, 3351.
 Sanguinetti, J., 3257.
 Saposchnikoff, A. V., 1073.
 Sarasin, Jean, 465-466, 468.
 Sato, A., 2723.
 Sato, G., 3424.
 Sato, Masayoshi, 3420, 3435.
 Sato, Shoichi, 808.
 Saussure, Théodor de, 19, 434.
 Savarè, B., 916.
 Savini, G., 1568.
 Sawamura, S., 1423.
 Schaeffer, Gustave, 1019, 2681, 3439.
 Schaer, Eduard, 1339.
 Schaertler, L., 2602.
 Schaffgan, K., 1286.
 Schardinger, Franz, 627-628, 3287.
 Scharling, 1354, 1792.
 Schaub, C., 2220.
 Schaum, Karl, 1304.

- Scheermesser, 3163.
 Scheffer, 1425.
 Scheibler, C., 66, 444-445, 447, 1806, 1930.
 Scherer, 3293.
 Scheringa, K., 798.
 Schermerhorn, A. R., 3021.
 Scherrer, P., 1268.
 Scherzer, K. von, 2452.
 Scheurer, F., 1021.
 Scheurer, Oscar, 1019.
 Scheven, H., 2177.
 Schiemenz, P., 2424B-2424C.
 Schierbeck, N. P., 2815, 2821.
 Schiff, Hugo, 674.
 Schiffer, Anton, 239.
 Schimper, A. F. W., 534.
 Schinner, A., 931.
 Schipiloff, Catherine, 2810.
 Schklowsky, H., 1904.
 Schleich, C. L., 964, 969.
 Schleimer, A., 1915.
 Schlesinger, M. D., 2620, 2623, 2625-2626, 2709, 2727.
 Schmalz, Karl, 407.
 Schmerber, Oscar, 1022.
 Schmid, L., 1007, 1102.
 Schmidt, Alfred, 3443.
 Schmidt, Ch. Ed., 3297.
 Schmidt, Dorothea, 3347.
 Schmidt, Erich, 1036.
 Schmidt, H., 2257.
 Schmidt, Robert, 2185, 2191.
 Schmitt, C., 54-55.
 Schmitz-Dumont, Winny, 1951.
 Schneider, 715.
 Schneidewind, 2136, 2147, 2851.
 Schoen, M., 117, 2879.
 Schoenbein, C. F., 657, 854.
 Schoendorff, B., 2683.
 Schoenn, 1406.
 Scholl, A., 1541, 1775.
 Schoor, W. K. J., 690.
 Schorokauer, H., 3160.
 Schowalter, E., 1547.
 Schrader, J. C. C., 11.
 Schreib, H., 1761, 2311, 2422.
 Schreiner, L., 686.
 Schryver, S. B., 605, 608.
 Schubert, Friedrich, 1631, 1636-1637, 1779.
 Schubert, Stanislaus, 887, 1065-1066, 1408.
 Schuetz, G., 1852.
 Schuetze, R., 2421.
 Schuetzenberger, P., 1058-1060.
 Schulte, J., 2046.
 Schulte, Wilh., 781.
 Schultze, W., 1726.
 Schulze, Carl, 2776-2777, 2818, 3109.
 Schulze, Ernst, 163, 1603, 1756.
 Schulze, Franz, 1111, 1127, 1397, 1721.
 Schulze, J. H., 1955.
 Schulze, Ludwig, 53.
 Schumann, G., 1673, 1675.
 Schwab, E., 1577.
 Swarcz, E., 1556.
 Schwarz, Carl, 3001.
 Schwarz, Eduard, 2378.
 Schwarz, H., 1571.
 Schwarz, M., 2023.
 Schwarzer, Aug., 157, 1727.
 Schweigart, Hans, 2992.
 Slavo, A., 3237.
 Scott, Leonard C., 2731.
 Scovell, M. A., 1739.
 Sebor, Joh., 1235.
 Seegen, J., 182.
 Seeligmann, 3151.
 Seelos, H., 2424.
 Sellner, Erich, 3107.
 Semmens, Elisabeth S., 806, 819, 3084.
 Sen, D. L., 2350.
 Sen, K. C., 960.
 Senff, Theodor, 240.
 Senior, James K., 3318.
 Seput, Ant., 841.
 Sero, Cesare, 368, 408-409.
 Sestini, Fausto, 710.
 Seuffert, R. W., 138.
 Seure, J., 2464.
 Sevenster, S. S., 338.
 Seyda, Anton, 1173.
 Seydel, H., 2590.
 Seyfert, Friedrich, 1465, 1701.
 Seyffert, H., 2610, 2665, 2668.
 Seymour, R. J., 2730.
 Shedd, O. M., 3408.
 Sherman, Henry C., 373, 379, 383, 589, 1608, 1766, 2620, 2623, 2625-2629, 2709-2710, 2727, 2764, 2773, 2880, 2934, 2945, 2952-2954, 2968-2970, 2984-2986, 3002, 3022, 3191.
 Sherwood, Sidney F., 1917-1918.
 Shier, John, 1990.
 Shimizu, T., 2983.
 Shimoyama, Ynichi, 889.
 Shuey, Ralph C., 3413.
 Sieben, J., 58.
 Siedich, A. S., 3348.
 Siegert, Theodore, 1573.
 Siemens, 2169, 2190.
 Siewert, 1579.
 Sigmond, A. von, 1853.
 Sigmond, Elek von, 280.
 Sigmund, Wilhelm, 2843.
 Silmann, S. H., 650.
 Silvestre, 2438.
 Simmonds, P. L., 2006.
 Simon, D., 2867.
 Simpson, A. G., 3451.
 Sirk, H., 1077.
 Sitnikoff, A., 3269.
 Sjöberg, Knut, 417, 428, 497, 502, 614-615, 2758, 2765-2766, 3058, 3337.
 Sjölema, B., 1772, 2426.
 Sjöstrom, Otto A., 2428.
 Skinner, R. P., 2324.
 Skraup, Zdenko H., 452, 1077.
 Slosse, A., 2868, 3041.
 Small, James C., 1165, 1712.
 Smirnoff, A. P., 641.
 Smith, George McP., 1260, 2541, 2552.
 Smith, Herbert E., 2794.
 Smith, O. C., 1345, 2113.
 Smith, W. B., 1782.
 Smith, Watson, 1079, 2457.
 Smorodintzev, I. A., 3003-3004.
 Société générale de maltose de Bruxelles, 210.
 Soehngen, N. L., 3304.
 Soeldner, Fr., 3174.
 Sokolinski, J. J., 2583.
 Sollied, P., 3156.
 Sollmann, Torald, 1269.
 Somló, Karl J., 2839.
 Sonstadt, E., 869.
 Sostegni, Livio, 540.
 Soubeiran, J. Léon, 842, 1401.
 Soxhlet, F., 56, 685, 1454.
 Speakman, Horace B., 3320, 3329-3330.
 Spence, J. N., 1466.
 Spencer, Mabel, 2632.
 Sperlich, Adolf, 1856.
 Spitzer, J., 1455.
 Spönsler, O. L., 1282-1283.
 Spring, Walthère, 1206.

- Sprockhoff, 1284, 1516, 1752-1753, 2358, 2360, 2410.
 Squire, W. S., 194.
 Ssajević, V., 478, 493.
 Staedeler, A., 656.
 Staiger, 3349.
 Stammer, K., 2187.
 Stanescu, P. P., 1717.
 Stanton, R., 2302.
 Starczewski, B., 3434.
 Starke, J., 701.
 Starkenstein, Emil, 2881, 2898, 2917.
 Staub, Max, 639.
 Stauffer, M., 813.
 Steenbuch, Chr., 190.
 Stein, 79.
 Steingroever, Arnold, 649.
 Stempel, B., 1749.
 Stengel, 2153.
 Stephenson, R. E., 2529.
 Stern, Ernst, 2553.
 Stiasny, Ferdinand, 2261.
 Stirnus, 1984, 1987, 2371.
 Stockham, W. L., 1266.
 Stocks, H. B., 782, 885-886.
 Stocks, Percy, 2955, 3164.
 Stohmann, F., 1216.
 Stollár, Julius, 2206.
 Stone, Winthrop E., 272, 705, 1609, 1764-1765, 3261.
 Storer, F. H., 1888.
 Storm, C., 1177-1178.
 Strasburger, J., 1771.
 Street, J. P., 1502.
 Stricker, Paul, 494.
 Strohmer, F., 44.
 Stromeyer, 830.
 Stumpf, M., 682, 1757.
 Sturm, W., 1569.
 Stutzer, A., 1467.
 Suessenguth, Otto, 2382.
 Suida, W., 720, 1062.
 Sulc, O., 268.
 Sullivan, B., 429.
 Sullivan, Owen, 2583A.
 Sunder, Charles, 2584.
 Sury, Joseph von, 2089.
 Suryanarayana, M., 3435A.
 Sutthoff, 1776.
 Suzuki, Kakuo, 2994.
 Svanberg, O., 391, 2942, 3339.
 Svoboda, Al., 187.
 Swan, Enoch, 1287.
 Swanson, C. O., 827, 2925.
 Sworykin, A. I., 132.
 Sykes, Walter J., 2666, 3176.
 Symons, W. H., 1813.
 Syniewski, Wiktor, 308, 430-431, 453, 624, 970,
 1023-1024, 1043, 2778-2780, 3152.
 Szegő, E., 780.
 Szilágyi, Julius, 2604.

T

- Tadokoro, Tetsutaro, 807-808, 1871C.
 Tagliani, Giovanni, 3471.
 Taine, Henry, 2408A.
 Takamine, Jokichi, 3117, 3262, 3382, 3461.
 Takamine, Jokichi, jr., 3331.
 Takeo, Okada, 2988.
 Tamba, R., 1098.
 Tanaka, Yoshio, 917, 927, 2318, 2680, 3393.
 Tanberg, A. P., 2627.
 Tanret, Charles, 585-586, 1154, 1166, 1889.
 Tappeiner, H. v., 2835.
 Taylor, T. Clinton, 593, 625-626.
 Teichke, R. F. von, 3387.

- Telle, M., 1536.
 Teller, G. L., 126, 2100.
 Temminck Groll, J., 377, 2956, 2971, 3016.
 Tempus, F., 1661.
 Tendeloo, H. J. C., 1295.
 Tendick, Frank H., 1647.
 Terlikowski, K., 2695.
 Terrat, P., 3116.
 Terroine, Emile F., 2841, 2899, 2918.
 Teschendorf, Werner, 1114.
 Teutem, E. van, 775.
 Thatcher, R. W., 3414.
 Thaysen, A. C., 3328, 3338.
 Thénard, 440, 993, 2170, 2416A.
 Thenius, Georg, 2207, 2420.
 Thevenot, G., 378.
 Thibierge, 2444.
 Thiel, C., 2448.
 Thoerner, Wilhelm, 1740.
 Thom, Charles, 3304B.
 Thomas, Arthur W., 464, 582, 2773, 2934, 2946,
 2952.
 Thomas, E. M., 608.
 Thomas, P., 1150.
 Thomas, Walter, 1668.
 Thomas, William, 1274.
 Thompson, Phebe K., 828.
 Thomsen, Th., 683.
 Thomson, William, 1305, 1900.
 Thorne, L. T., 1539.
 Tian, 1716.
 Tiebackx, F. W., 609.
 Tingle, Alfred, 1698.
 Tinkler, Charles K., 918.
 Tollens, Bernhard, 93, 285, 996-997.
 Tombeur, F., 2142.
 Tomecko, C. G., 1099.
 Tomlinson, Charles, 878.
 Tondera, F., 721.
 Tonegutti, Mario, 1777.
 Tongs, M. S., 3321.
 Toso, Pietro, 2222.
 Tóth, Julius, 890.
 Toxtelli, M., 2045.
 Trambics, J., 1853.
 Traphagen, F. W., 1611.
 Traquair, John, 1075, 1081, 2319, 2488, 2531, 2543.
 Traube, Wilhelm, 799.
 Trécul, A., 1131.
 Triester Reisschälfabrik-A. G., 2402.
 Tright, H. van, 2916.
 Trojanowsky, Piers, 1592.
 Trommer, 1791.
 Tromp, E., 2591.
 Trostel, L. J., 1297.
 Trotmann, S. R., 2491.
 Trousoff, A., 774.
 Truax, T. R., 2537.
 Truthe, Wilhelm, 1247-1248.
 Tryller, H., 594, 1476.
 Tschirch, A., 1409, 1904.
 Tschirikow, A. D., 894.
 Tsukiye, Sogen, 2988.
 Tsvett, 716.
 Tunmann, O., 1418.
 Turquet, J., 3275.
 Tussenbroek, M. J. van, 403.
 Tuthill, 16.

U

- Uebe, Wilhelm, 138.
 Ugglas, B. af, 3399.
 Uhland, W. H., 2215, 2248.
 Uhler, E., 121.

Ujihara, K., 2947.
Ullik, F., 698, 1213.
Ulrich, C., 266.
Underhill, F. P., 3394.
Unna, Eugene, 1857.
Urban, Anton, 3356.
Utaka, Harukaze, 2412.

V

Valentin, G., 174.
Vandenbergh, H., 942.
Vanderkleed, Chas. E., 2909.
Van Deusen, W., 3464.
Vandeveld, A. J. J., 2882.
Van Deventer, Ch. M., 888.
Vanino, L., 931.
Van Laer, Norbert, 80.
Vauquelin, 2372A, 2413.
Velpeau, 2437.
Venkataraman, K., 1869.
Venn, H. J. P., 498.
Ventzke, K., 2439.
Verkade, P. E., 2129.
Vermeulen, 418.
Vernon, H. M., 2671, 2673, 2830, 3119.
Verschaffelt, E., 775.
Verzár, Fritz, 748.
Viale, G., 791, 815.
Vibrans, 2021, 2024, 2034.
Victorow, C., 574, 2683.
Viehoefer, Arno, 2154.
Vielte, 1208.
Vignon, Léo, 735.
Vilikovski, V., 1416, 1749.
Villaroel, M. J., 3005.
Villars, A., 1395.
Villiers, A., 3238-3240.
Vincent, 651.
Vintilescu, J., 814.
Virneisel, Ferd., 1149, 2484.
Visco, Sabato, 3043.
Visez, A., 1285.
Viswanath, B., 2137, 2932, 3429, 3435A.
Vogel, August, 14, 38, 870, 872, 1138, 1141, 1724, 1928.
Vogel, J., 259.
Vogelenzang, E. H., 1988.
Vogt, E., 1865.
Vohl, H., 2417.
Voigtlaender, E., 1702.
Voit, Erwin, 1232.
Vollant, André F., 1543.
Voorhees, V., 1648.
Vries, Hugo de, 538-539, 1781, 2110.
Vuillemin, Paul, 3276.
Vulquin, E., 2911.
Vulté, H. T., 1469.
Vuytsteke, Jules, 241.

W

Wachsmann, M., 2831.
Wacker, Leonhard, 457, 459-460.
Waelti, W., 636, 639.
Wagner, Hans, 2575.
Wagner, L. von, 2216, 2232-2233.
Wagner, T. B., 2309, 2315.
Waksman, Selman A., 3167.
Walden, P., 1244.
Waldschmidt-Leitz, Ernst, 3103, 3110.
Walker, Florence, 383, 2953, 2969, 3002.

Walker, Hilda, 3023.
Walker, Jennie, 2945.
Wallerstein, Leo, 3465.
Wallis, T. E., 1867, 2158.
Walpers, G., 1992.
Walter, F. C., 1267.
Walton, George P., 1663.
Warcollier, G., 2844.
Wardell, S. E., 2406.
Warth, F. J., 768.
Wary, S., 3063.
Wasmund, W., 396.
Wastl, H., 954.
Watanabe, Shukichi, 1871C.
Waterman, H. I., 2109, 2111-2112.
Watson, C. E., 1698.
Watson, F. S., 950.
Watson, William H., 2790.
Wayman, Marguerite, 2968.
Weatherwax, Paul, 2155.
Wedeman, W., 3066A, 3436.
Wehmer, C., 2328, 3270, 3290.
Weigelt, C., 2424A.
Weill, Jeanne, 2918.
Wein, L., 1852.
Weingaertner, Eduard, 1251.
Weiser, Stephan, 1616.
Weiss, Adolph, 665.
Weiss, H., 1713, 1715.
Weitz, R., 3067.
Weizsacker, A., 64.
Welker, Wm. H., 3097.
Weller, Heinrich, 1522.
Wells, J. G., 224.
Welmans, P., 1526.
Welwart, N., 1151.
Welzmueller, Ferdinand, 395.
Wender, Neumann, 1706.
Wenglein, O., 1532, 1537, 2076.
Went, F. A. F. C., 3322.
Wenzel, Erwin, 3106.
Wertheimer, Ernst, 2972-2973.
Wesener, J. A., 126.
West, Clarence J., 1089.
Westhoff, F., 1083.
Wheeler, R. V., 1254.
Whewell, G., 1204.
Whewell, W. H., 2576.
Whymper, R., 736.
Wichmann, A., 1498, 2077.
Wicke, Wilh., 1132.
Widmer, A., 1923.
Wiedemann, E., 1207.
Wiegman, D., 298.
Wieninger, F. M., 1560, 1670.
Wierzchowski, Zenon, 361.
Wiesner, Julius, 665, 1405, 2449, 2492.
Wijsman, H. P., 2650.
Wilde, C., 2087.
Wilenko, G. G., 3160.
Wiley, Harvey W., 1477, 1517, 1768, 2044, 2281.
Will, Wilhelm, 1070.
Willaman, J. J., 1922, 2044.
Williams, Dawson, 2809, 2813.
Williams, R. H., 2355.
Williams, Rowland, 1941.
Willstaetter, Richard, 3103, 3110.
Wilson, E. G., 770.
Wilson, J. Arthur, 699, 2603.
Wilson, L. C., 3199.
Windisch, W., 204, 242, 300, 309, 397, 419, 432-433, 711, 2577, 2728, 2748, 2767, 2840, 2926, 3023A, 3153, 3209, 3212, 3366, 3395, 3421, 3472.
Winter, Albert, 2536.
Winton, A. L., 1759.
Wirth, Chr., 3186.

Wischo, F., 2344.
 Wise, F. B., 2356.
 Wissel, von, 1911.
 Witlich, M., 1159.
 Witte, H., 1689, 1705.
 Wohl, A., 65, 345.
 Wohlgemuth, J., 983-984, 2875, 2900, 3074, 3158, 3162.
 Wojczyński, M., 2834.
 Woker, Gertrud, 972, 975-976, 978, 985-986.
 Wolfe, H., 2087.
 Wolff, C. H., 1448.
 Wolff, Jules, 318, 322, 326, 330-332, 559, 724, 726, 1026-1027, 1307-1308, 1358, 1362-1364, 1366, 1369, 1375-1377, 1382, 1622, 2855, 2861.
 Wolff, Justus, 1927.
 Wolff, Ottomar, 1669, 1789, 3196.
 Wolffenstein, R., 1103.
 Wolfs, H., 1684.
 Wolfsohn, Kurt, 611-612.
 Wood, R. W., 2820.
 Woodman, J., 2585.
 Wooley, V. J., 2930.
 Worden, Edward C., 1084.
 Wortmann, Julius, 3228, 3370.
 Woy, Rudolf, 2094.
 Wrede, Hans, 2493, 2497-2499, 2504-2506, 2566.
 Wright, H. E., 3261.
 Wróblewski, Augustin, 1146-1147, 2611-2612, 2663, 2834, 3177, 3266.
 Wurmser, René, 749.
 Wurster, C., 1013, 1671.

Y

Yamasaki, Yoshio, 3433.
 Yano, M., 2408.
 Yegorov, I. V., 2605, 2607, 2654.
 Yoder, Lester, 1912.
 Yoshimura, K., 2095.
 Yoshino, M., 1330.
 Youle, W. E., 1885.
 Young, J. W., 667.
 Young, Robert A., 706.
 Yvon, M., 2613.

Z

Zahn, C., 2427.
 Zaitshek, Arthur, 1616, 3388.
 Zakharoff, 2.
 Zechmeister, László, 809.
 Zega, Zorka, 1097.
 Zellner, Julius, 3288-3289.
 Zerewitinoff, T., 1964.
 Ziegenspeck, H., 1787, 1871A.
 Zimmermann, A., 2901.
 Zipperer, Paul, 1588, 1818.
 Zlataroff, A., 2130.
 Zsigmondy, Richard, 1228.
 Zulkowski, Karl, 441-442, 446, 448, 1143, 2597, 2599, 2638.
 Zuntz, 2472-2473.
 Zwicker, J. J. L., 487-488, 600, 816, 1436.

INDEX OF SUBJECTS

Numbers refer to individual entries, not to pages

A

Acetic acid from starch by fermentation, 3222, 3237, 3245, 3277, 3305, 3323, 3344.
 Acetol from dextrin, 800.
 Acetone from starch by distillation, 694.
 Acetone from starch by fermentation, 3309, 3316-3317, 3319-3320, 3323, 3328-3330, 3335, 3338, 3340-3341.
 Achroodextrin, 69, 86, 119, 159, 176, 179, 183, 238-239, 245, 247-248, 250, 252, 267, 270-271, 283, 288, 298, 313, 359, 370, 382, 404, 448, 451, 459, 689, 717, 1025, 1028, 1242, 1247, 1267, 1887, 2755, 3130, 3308.
 Acetyl derivative, 179, 404.
 Adsorption by aluminium hydroxide, 779.
 Adsorption by charcoal, 779.
 Benzoyl derivative, 404.
 Acorn starch, 1193, 2114, 2129.
 "Activin," 2580.
 Alkali starches. *See* Starch, action of alkalies; Starch, use in sizing.
 Allyl starch, 1099.
 Alpha-amylase, 415, 427, 431, 624, 2779.
 Alpha-amylase, 550, 560, 580, 589-590, 592, 602, 625, 818A.
 Alpha-beta-hexaamylose, 606, 1667.
 Alpha-diamylose, 634, 639.
 Alpha-hexaamylose, 606, 631, 644-646.
 Alpha-octaamylose, 639.
 Alpha-tetraamylose, 482, 631, 634, 639, 645, 648.
 Amidique, 995.
 Amidin, 434, 510, 513, 834.
 Amidulin, 159, 537, 911-912, 1127. *See also* Soluble starch.
 Amyl alcohol from starch by fermentation, 3244-3245.

AMYLASES:

Absorption spectra, 1210.
 Absorptive properties, 2715-2716, 2752.
 Action of acid salts, 2645.
 Action of acids, 140, 2675-2676, 2746, 2769, 2789, 2791, 2826, 2831, 2836, 2879, 2919. *See also* Amylases, optimum pH; Amylases, destructive action of acids; Starch, enzymic hydrolysis, influence of acids and alkalies.
 Action of alanine, 2966.
 Action of albumins, 2817.
 Action of alcohol, 228, 2594, 2656, 2673, 2683, 2790, 2803, 2807, 2851, 2941, 3036, 3291.
 Action of aldehydes, 2777.
 Action on algae, 2698.
 Action of alkalies, 140, 2691, 2769, 2826, 2831, 2838, 2874, 2919.
 Action of alkaloids, 2848, 2892, 2960, 3003, 3020, 3165.
 Action of aluminium salts, 2817, 2851, 2888-2889.
 Action of amides, 2891, 2944.
 Action of amine salts, 2891, 2944, 2958, 2986.
 Action of amino acids, 2837, 2847, 2918, 2944, 2947, 2953, 2969-2970, 2984-2985, 2992, 3002, 3008, 3015, 3022.
 Action of amino sulphonic acids, 2944.
 Action of ammonium salts, 2890-2891.
 Action of aniline, 2965-2966, 2986, 2997.
 Action of anthranilic acid, 2986.
 Action of antimony compounds, 3004.
 Action of arsenic compounds, 3004.

Amylases, continued.

Action of asparagin, 2664, 2819, 2832, 2837, 2847, 2851, 2953-2954.
 Action of bacteria, 2687.
 Action of benzamide, 2986.
 Action of benzoic acid, 2910, 2986.
 Action of bile salts, 2800, 2809, 2813, 2875, 2877-2912, 2915, 2956, 2998.
 Action of blood salts, 2818.
 Action of blood serum, 2769, 3427.
 Action of borax, 2783.
 Action of boric acid, 2807, 2876.
 Action of bromides, 2946.
 Action of cadmium chloride, 393.
 Action of cadmium salts, 2884.
 Action of caesium salts, 2890.
 Action of caffeine, 2777.
 Action of calcium chloride, 393, 2806, 2977.
 Action of calcium salts, 2827, 2840.
 Action of carbon dioxide, 2787-2788, 2815, 2818, 2821, 2832-2833, 2976.
 Action of carbonates, 3019.
 Action of chloroform, 2791, 2968, 3218.
 Action of cholesterol, 2912, 2993.
 Action of chromium compounds, 2887, 2889.
 Action of cobalt ammoniates, 2979.
 Action of collodion, 2690.
 Action of copper, 2964, 2983.
 Action of copper salts, 319, 2642, 2791, 2838, 2863, 2873, 2886, 2938, 2965, 2968, 2996-2997.
 Action of creosote, 2909.
 Action of dentifrices, 3021.
 Action of dry ammonia, 2703-2704, 2707-2708, 2715.
 Action of dry HCl, 2696, 2704, 2706, 2708.
 Action of egg yolk, 2866, 2878.
 Action of electrical currents, 2684, 2686, 2697, 2723, 2772, 2904. *See also* Amylases, electrical migration; Starch, enzymic hydrolysis, influence of electrical currents.
 Action of electrical light, 3070.
 Action of eosin, 2835.
 Action of ether, 2599, 2851, 3036, 3291.
 Action of ferrous sulphate, 2862.
 Action of fluorescent substances, 2835.
 Action of fluorides, 218.
 Action of formaldehyde, 2808, 2839, 2909, 2939, 2966, 2968.
 Action of gastric juice, 2600, 2789.
 Action of glycerol, 2753.
 Action of gold salts, 2886, 2996.
 Action of halogens, 2692, 2757, 2907-2908, 2939, 2966, 2974, 2989, 2997.
 Action of heat, 157, 166, 2618, 2754, 2675-2676, 2727, 2744, 2755, 2769, 2780, 2879, 3009, 3024-3068, 3126, 3410. *See also* Amylases, optimum temperatures; Amylases, destructive temperatures; Amylases, action of low temperatures; Starch, enzymic hydrolysis, influence of temperature.
 Action of heat-inactivated amylases, 2842.
 Action of hippuric acid, 2986.
 Action of hydrofluoric acid, 212, 218, 225.
 Action of hydrogen peroxide, 1030, 2792, 2906, 2923.
 Action of hydrogen sulphide, 2665, 3069.
 Action of hydroxylamine, 2808, 2966.
 Action of imides, 2944.
 Action of insulin, 3006.
 Action of invertase, 2834.

Amylases, continued.

- Action of iodoform, 2814.
- Action of iron salts, 2888, 2966.
- Action of Kambara earth, 2994.
- Action of lactic acid, 2675, 2818, 2832-2833, 2838, 2914.
- Action of lead salts, 2996, 3093.
- Action of lecithin, 2894, 2899, 2912-2913, 2961, 2993.
- Action of leucine, 2966.
- Action of lipoids, 2898-2899, 2913, 2955.
- Action of lithium salts, 2890.
- Action at low temperatures, 664, 3035.
- Action of low temperatures, 2669, 2683.
- Action of lysine, 2985.
- Action of magnesium salts, 2888, 2920.
- Action of manganous salts, 2888.
- Action of manganous sulphate, 2862.
- Action of mercuric chloride, 2814, 2964, 2984.
- Action of mercury salts, 2838, 2872, 2884, 2966, 2983.
- Action of metals, 2983, 2999.
- Action of naphthol, 2807.
- Action of nitric oxide, 2705.
- Action of nitriles, 2891.
- Action of oleates, 2955.
- Action of oxidizing agents, 2939, 2974.
- Action of ozone, 2843.
- Action of palladium salts, 2886.
- Action of papain, 2600.
- Action of pepsin, 2750, 2810, 2834, 2842.
- Action of phenols, 2784, 2791, 2795, 2814, 2909, 2922.
- Action of phenylhydrazine, 2965-2966.
- Action of phosphate mixtures, 355, 2621, 2817-2818, 2846, 2851, 2864-2865, 2883, 2897, 2919, 2925, 2916, 2937, 2945, 2976.
- Action of phosphatides, 2998.
- Action of platinum salts, 2886.
- Action of potassium salts, 2890, 3011-3012.
- Action of proteins, 2782, 2793, 2796, 2944.
- Action of proteolytic enzymes, 2734.
- Action of ptomaines, 2960.
- Action of radioactive substances, 3000, 3074, 3081, 3083.
- Action of Roentgen rays, 3080, 3085.
- Action of rubidium salts, 2890.
- Action of saccharine, 2807, 3001.
- Action of salicylic acid, 2791, 2807, 2814, 2910.
- Action of serum, 2900, 2927, 2995.
- Action of silver, 2964.
- Action of silver salts, 2884, 2938, 2965, 2996-2997.
- Action of soaps, 2943, 2961.
- Action of sodium aspartate, 2953-2954.
- Action of sodium chloride, 2797, 2806, 2812, 2830, 2949, 2976-2977, 2995, 3011, 3054, 3286.
- Action of sodium fluoride, 2816, 2963, 2966.
- Action of sodium salts, 2890.
- Action of sodium sulphite, 2741, 2807, 2966.
- Action of sodium thiosulphate, 2939, 2966.
- Action of sunlight, 3069-3073, 3082.
- Action of tannin, 2844, 2933.
- Action of thiocyanates, 3010.
- Action of toluene, 2968, 3036.
- Action of triethylamine, 2919.
- Action of trypsin, 2750, 2768, 2834.
- Action of tryptophane, 2986, 3022.
- Action of ultra-violet rays, 3064, 3075-3079, 3082, 3086-3089.
- Action of uranium salts, 2798, 2966.
- Action of uranyl acetate, 2768, 2865, 3014.
- Action of urea salts, 3003.
- Action of urine constituents, 2942.
- Action of various reagents, 2781.
- Action of various salts, 391, 2627, 2736-2737, 2769, 2785, 2796, 2825, 2831, 2836, 2855, 2880, 2885,

Amylases, continued.

- 2893, 2902, 2921, 2930, 2934, 2951, 2957, 2966, 2981, 2991-2992, 3018, 3023.
- Action of vitamins, 2967, 2988, 3005.
- Action on yeast, 2698.
- Action of yeast extract, 2972.
- Action with yeast, 241, 301. *See also* Amylases yeast complement.
- Action of zinc salts, 2884, 2886, 2977.
- Activation and inactivation by salts, acids, etc., 2781-3025. *See also* Amylases, action of various salts.
- Adsorption, 2745, 3090-3110.
- Adsorption of ammonia, 2752.
- Adsorption on mucin, 2746.
- Adsorption by starch, 352, 2881.
- Aldehyde nature, 2741.
- Amphoteric nature, 2688, 2773, 2980, 3092.
- Ash, 2595, 2605, 2607.
- Auto-excitation, 558.
- Coagulation, 2676.
- Co-enzyme, 420, 1110, 2845, 2856-2857, 2870, 2881, 2883, 2895-2897, 2911, 2957, 2975, 2992.
- Commercial preparations, 2670, 2689, 2924, 2929, 2982, 2999, 3122, 3167, 3180, 3188, 3449-3450, 3462, 3482.
- Commercial preparations, trade names, 3468. *See also* Balmal; Brimal; Clenbumol; Diastafor; Diastasolin; Farinol; Fermasol; Maltine; Novofermasol; Polyzime; Rapidase.
- Conductivity, 349.
- Destruction during the mashing process, 2664, 2701.
- Destructive action of acids, 2691, 2738, 2740, 2745, 2929.
- Destructive temperatures, 241, 307, 350, 358, 396.
- Destructive temperatures, influence of colloidal material, 408.
- Destructive temperatures, influence of maltose, 345, 358, 3029-3030, 3049.
- Destructive temperatures, influence of starch, 345, 3043.
- Determination, 2917.
- Determination of activity, 391, 412, 2665, 2829, 3111-3215.
- Determination of amylolytic activity, 3040, 3154-3170, 331.
- Determination of saccharogenic activity, 3172-3215.
- Dialysis, 2769, 2845, 2856-2857, 2868, 2870, 2881, 2883, 2895-2897, 2903, 2975, 2992, 3011, 3047, 3177, 3291, 3410.
- Diffusion, 2747.
- Electrical conductivity of solutions, 2746, 3032.
- Electrical migration, 2617, 2630-2631, 2681, 2688, 2736, 2773, 2911. *See also* Amylases, action of electrical currents.
- Electrodialysis, 2911.
- Elementary composition, 2597, 2604-2606, 2623, 3172, 3361, 3387.
- Filtration, 2754, 3090-3091, 3094, 3096, 3101, 3145, 3410.
- General characteristics, 2633-2780.
- Guaiacon hydrogen-peroxide reaction, 2824.
- Heat of combustion, 2623.
- Industrial applications, 3437-3485. *See also* Amylases, uses.
- Isoelectric point, 2736, 2773, 2931.
- Molecular amylolytic power, 2759.
- Molecular weight, 2996.
- Nitrogen content, 2595, 2610, 2627, 2642-2643, 2710, 2732, 3102, 3291.
- Optical rotation, 2622.
- Optimum pH, 2632, 2736, 2758, 2764, 2786, 2916, 2926, 2931, 2934-2935, 2945, 2948, 2950, 2952, 2959, 2966, 2971, 2976, 2978, 2980, 2982, 3011, 3016-3017, 3054, 3058, 3066, 3149, 3324, 3332, 3337, 3473. *See also* Starch, enzymic hydrolysis, influence of acidity or alkalinity.

Amylases, continued.

- Optimum temperatures, 140, 145, 157, 166, 195, 354, 374, 421, 2668, 2680, 2755, 2771, 2925, 3024-3068, 3291, 3334, 3473. *See also* Amylases, action of heat.
- Periodicity, 2729.
- Phosphorus content, 2607, 2653, 2775.
- Poly-enzyme theory, 175, 290, 318, 396, 417, 615, 2617, 2642, 2655, 2659, 2665, 2667-2668, 2672, 2674, 2677, 2689, 2693-2695, 2699, 2712, 2737, 2739, 2748, 2756, 2760, 2767, 2769, 2771, 2833, 2941, 3028, 3037, 3040-3041, 3058, 3066, 3102, 3109, 3169, 3387, 3390, 3435A.
- Precipitation, 2981, 3007, 3097.
- Precipitation by ferric hydroxide, 2617.
- Precipitation by starch, 1360, 3100.
- Preservation, 326, 558, 2685, 2731, 2733, 2743-2744, 2753, 2762-2764, 2770, 2933, 3002.
- Preservation by sodium chloride, 2600.
- Protein nature, 2600, 2606-2608, 2610, 2612, 2614, 2617, 2620, 2622, 2624-2625, 2627, 2630, 2632, 2639, 2661, 2663, 2710, 2716, 2726, 2734, 2739, 2742, 2749, 2768, 2962, 2985, 3099, 3102-3103, 3172.
- Purification, 210, 2592-2632, 3093, 3103, 3107.
- Reviews, 2702, 2711, 3177.
- Silicon content, 2775.
- Solubility, 2749, 2755.
- Sources and occurrence, 3350-3436. *See also* Amylases of various plants.
- Standard solution, 412.
- Sulphur content, 2595.
- Surface tensions of solutions, 2940, 3045.
- Synthesis. *See* "Artificial" amylase.
- Terminology, 2647, 2672.
- Tyndall phenomenon, 2624.
- Ultrafiltration, 2622, 2992.
- Ultramicroscopic examination, 1231, 2617, 2744.
- Unit of measurement, 2610, 3156, 3158, 3172, 3185, 3191, 3209.
- Uses, 3437-3485.
- Use in bread making, 3442, 3446-3447, 3451, 3457, 3463, 3473, 3477, 3483.
- Use in clarifying fruit jellies, 3466.
- Use in desizing of textiles, 3167-3168, 3325, 3437-3485.
- Use in removing starch from laundered goods, 3462, 3464.
- Use in removing starch from paper, 3459.
- Use in treatment of sorghum juice, 1918.
- Yeast complement, 406-407, 416, 428-429, 1670. *See also* Amylases, action with yeast.
- Zymogen, 1112, 2720, 2730, 2957, 3119.
- Amylases of alfalfa, 3411, 3413.
- Amylases of animal secretions, 3381, 3405.
- Amylases of *Aspergillus niger*, 2980.
- Amylases of *Aspergillus oryzae*, 589, 2952, 3167, 3229. *See also* Polyzime; Takadiastase.
- Amylases of bacteria, 3216-3349.
- Amylases of barley, 390, 2749, 2761, 2860, 3368, 3383, 3386-3387, 3389-3390, 3395, 3399, 3401, 3403, 3416.
- Amylases of beans, 3358, 3415.
- Amylases of blood, 3134, 3214, 3373, 3376.
- Amylases of brain substance, 2998.
- Amylases of bran, 3385, 3393.
- Amylases of bryony root, 3430.
- Amylases of cheese, 3420.
- Amylases of cholam, 3429, 3435A.
- Amylases of corn, 3395.
- Amylases of fodders, 3412.
- Amylases of fungi, 3216-3349.
- Amylases of gall, 3367.
- Amylases of ginseng, 3424.
- Amylases of gums, 3369, 3372, 3404.
- Amylases of hen eggs, 3384, 3426.
- Amylases of honey, 2619, 3125, 3192, 3406, 3409-3410.
- Amylases of hops, 3374.
- Amylases of leaves, 3364, 3377.
- Amylases of liver, 3011.
- Amylases of lymph, 3373, 3375.
- Amylases of malt, 306, 3363, 3391, 3421, 3423, 3429, 3472.
- Properties, 2727, 2736, 2764, 2773, 2776, 2911, 2934-2935, 2945, 2952, 2966, 2968, 2980-2981, 2989, 2993-2994, 2997, 2999, 3009, 3012, 3017.
- Amylases of milk, 395, 2774, 3127-3128, 3388, 3420, 3435-3436.
- Amylases of millet, 3393.
- Amylases of moulds, 3216-3349.
- Amylases of oats, 3038, 3395.
- Amylases of pancreatin, 147, 173, 180, 183, 199, 228, 268, 336, 339, 348, 365, 589, 2620-2621, 2623, 2628, 2637, 2656, 2681, 2694, 2709, 2727, 2764, 2880, 2920, 2952, 2956, 2959, 2963, 2968, 2971, 2977, 2982, 2985-2986, 2988, 2991, 2995, 3002, 3008, 3020, 3022, 3103, 3351, 3354, 3357, 3418.
- Amylases of potato, 2720, 2734, 2992, 3355, 3395, 3417, 3419, 3434-3435.
- Amylases of radishes, 3392.
- Amylases of red algae, 2712.
- Amylases of *Rhizopus nigricans*, 2700.
- Amylases of rice, 3395, 3428.
- Amylases of rye, 390, 3395, 3397.
- Amylases of saliva, 3394, 3422.
- Properties, 148, 166-167, 173, 180, 188, 199, 213, 299, 369, 374, 381, 423, 2592, 2656, 2729-2731, 2736, 2904, 2916, 2920, 2931, 2933, 2944, 2951, 2956, 2962, 2966, 2986, 2993, 2999-3001, 3003-3004, 3010, 3015, 3350, 3398.
- Amylases of the skin, 3433.
- Amylases of the small intestine, 3352.
- Amylases of snails, 364.
- Amylases of sugar beets, 3378-3380.
- Amylases of sweet potatoes, 3419, 3425.
- Amylases of tobacco leaves, 3407-3408.
- Amylases of ungerminated cereals, 3382.
- Amylases of urine, 3136, 3365.
- Amylases of various plants, 2758, 3359, 3361, 3370, 3397.
- Amylases of wheat, 3366, 3395, 3402.
- Amylases of yeast, 290, 3216-3349.
- Amylates. *See* Starch, action of alkalies.
- Amylin groups, 443.
- Amylo-dextrinase, 2672.
- Amylo-glucase, 2672.
- Amylo-hydrolyst, 2647.
- Amylo-iodoform, 965.
- Amylo-maltase, 2672.
- Amyloamylose, 599, 602-603.
- Amylobiase, 612.
- Amylobiose, 612, 648.
- Amylocellulose, 370, 373, 533, 548, 556, 559, 595, 601, 1356-1357, 1359, 1362, 1364, 1366-1367, 1369-1372, 1375-1376, 1378. *See also* Starch cellulose.
- Amylocoagulase, 1358-1360, 1363-1364, 1366, 1369, 1375, 1377, 1388, 1393-1394, 2695. *See also* Starch solutions, coagulation.
- Amylodextrin, 69, 119, 245, 247-248, 250, 267, 278, 291, 302, 313, 333, 359, 370, 382, 390, 451, 532, 560, 606, 708, 785, 793, 970, 1025, 1038, 1043, 1071, 1146, 1247, 1289, 1342, 1372, 1904, 2665, 3121.
- Acetyl derivative, 308.
- Action of alkalies, 997.
- Action of formaldehyde, 970-971, 982.
- Crystallization, 542, 627, 1276.
- X-ray examination, 1276.
- Amylodextrinic acid, 1043.
- Amylodiestase, 3450.
- Amyloform, 963-969. *See also* Starch, action of formaldehyde.

Amylogén, 610, 1133, 1142, 1342.
 Amylohemiacellulose, 617, 1871B.
 Amyloins, 211, 216, 224, 229, 244, 247-248, 255, 264.
See also Maltodextrins.

Determination, 1470.

Amylopectin, 330, 339, 370, 412, 558, 564, 566, 571, 574-576, 578-579, 584, 592, 595-597, 599, 606, 609, 611-614, 616, 620, 622, 624-625, 630, 1351, 1370-1371, 1378, 1667, 1871, 2767. *See also* Alpha-amylase.

Action of formaldehyde, 988.

Action of hydrogen peroxide, 573.

Electrical migration, 574.

Enzymic hydrolysis, 416-417, 615.

Molecular weight, 597.

Phosphorus content, 412, 584.

Similarity to glycogen, 416.

Synthesis, 598, 603, 613, 621. *See also* Amylophosphoric acid.

Amylopectinase, 1370.

Amylophosphoric acid, 581, 587-588, 598, 600, 603, 606, 609, 618, 620-621, 1088, 1316.

Amylose, 330, 412, 564, 566, 570-571, 574-575, 579, 585-586, 592, 595-597, 599, 606, 609, 612, 614, 616, 625, 630, 714, 1351, 1371, 1378, 1390, 1667, 1871, 2976, 3007.

Action of formaldehyde, 988.

Action of hydrogen peroxide, 573.

Enzymic hydrolysis, 416-417, 615.

Fixation by cotton, 585.

Molecular weight, 597.

Phosphorus content, 584.

Amylose-octadextrin, 502.

Amylose phosphate, 598, 603.

Amyloses formed by bacterial degradation of starch, 476, 602, 627-650, 3239, 3339. *See also* Diamylose; Alpha-diamylose; Iso-diamylose; Triamylose; Beta-triamylose; Iso-triamylose; Tetraamylose; Alpha-tetraamylose; Hexaamylose; Alpha-Hexaamylose; Beta-hexaamylose; Octaamylose; Alpha-octaamylose.

Action of enzymes, 630.

Action of yeast, 630.

Amylosilicic acid, 618.

Amylotriose, 612.

Amyloxose, 591.

Anti-amylase, 1377, 2854, 2861, 2882, 2973, 3013.

Anti-amylcoagulase, 1377.

Arrowroot starch, 24, 167, 580, 620, 741, 762, 1006, 1196, 1801, 1804, 1813, 1992, 1994, 2003-2004, 2158, 2435, 3178.

Manufacture, 2057, 2210, 2228.

Artificial amylase, 2645-2646, 2649, 2654, 2678, 2713-2714, 2742, 2751, 2990. *See also* Starch, hydrolysis by salts.

"Artificial" amylose, 330, 1390.

"Artificial" starch, 321, 785, 1370, 1372-1374, 1411.

Auxoamylases, 2944, 2986, 3015.

B

Bacterial amylases, 3216-3349.

Baking. *See* Starch, conversion in bread.

Balmal, 3462.

Banana starch, 1544, 2089, 2115.

Beer dextrins, 1267, 1285, 1470-1471.

Benzyl dextrin, 1090.

Benzyl starch, 1090.

Beta-amylase, 415, 427, 2779.

Beta-amylase, 550, 560, 580, 589-590, 592, 602, 625, 818A.

Beta-hexaamylose, 484, 639-640, 642, 645-649.

Beta-triamylose, 631.

Brake fern starch, 2130.

Bread-making. *See* Starch, conversion in bread.

Brimal, 3462.

Buckwheat starch, 1828, 1843, 1903.

Bulrush starch, 2126.

Butyl alcohol from starch by fermentation, 3247-3317-3320, 3328-3330, 3338, 3340-3341.

Butyric acid from starch by fermentation, 3222, 3230-3237, 3245.

C

Carbon from dextrin, 803.

Carbon from starch, 670, 703, 730, 763, 803, 807-808, 869, 1015.

Carbon dioxide from starch, 670.

Cassava starch, 366, 741, 823, 1293, 1567, 1863, 2044-2058, 2069, 2071, 2081-2082, 2097, 2132, 2144.

Manufacture, 2058, 2069, 2071, 2083, 2208, 2216-2297, 2353.

Cellulosin, 3239.

Cereal starches, 1790, 1847.

Cerealine, 3353.

Cerelose, 134.

Chestnut starch, 1814, 1903, 1994, 1997, 2114, 2134-2344, 2444, 3317.

Extraction, 1998, 2049, 2129, 2206, 2332, 2344.

Chloral from starch, 656.

Chloropicrin from starch, 776.

Clenbumol, 3462.

Colored starches, 2450, 2452.

Corn starch, 64, 129, 131, 168, 215, 545, 620, 625-626, 741, 1293, 1296, 1324, 1326, 1346, 1353-1554, 1623, 1822, 1824, 1828, 1834, 1853, 1953-1987, 2052, 2281, 2509, 2515, 2523, 2526, 2532-2544, 2550, 2566, 2579, 2586.

Manufacture, 2052, 2054, 2079, 2138, 2193, 2202-2208, 2216, 2221, 2226, 2263, 2266, 2269, 2278-2279, 2281, 2287, 2304, 2308-2310, 2316-2317-2326, 2329, 2336, 2351, 2353, 2355, 2357, 2361-2365, 2426A, 2549, 2583.

Manufacture, by-products, 2216, 2304, 2310, 2317-2326.

Crocus starch, 2124.

Crystalline dextrins. *See* Amyloses formed by bacterial degradation.

D

Dakamballi starch, 2149.

Dekfa-Griess, 2574, 2577.

Dextrin dust, ignition temperature, 1252, 1254, 1263.

Dextrin hydrates, 786.

Dextrin iodide, antiseptic properties, 941.

Dextrin nitrate, 1055.

Dextrin purissimum, 779.

Dextrin sizes, preparation, 2494.

Dextrin solutions:

Interfacial tension, 1280.

Surface tension, 1280, 1301.

Dextrinases. *See* Amylases, poly-enzyme theory.

Dextrinic acid, 288.

Dextrino-glucose, 2672.

Dextrino-maltase, 2672.

Dextrinogen, 159.

Dextrinogenase, 2756.

Dextrinose, 308.

Dextrinozol, 804.

DEXTRINS:

Dextrins, 52, 245, 335, 451, 690, 698, 1872, 2042.

Absorption by charcoal, 1806.

Acid hydrolysis, 26, 41, 87, 97, 101-106.

Action of alkalies, 997.

Action of alkaline mercuric cyanide, 699.

Action of chromates and light, 677.

Dextrins, continued.

Action of heated glycerol, 700.
 Action of hydrogen bromide, 707.
 Action of hydrogen peroxide, 2475.
 Action of iodine at high temperatures, 814.
 Action of light, 660, 662.
 Action of X-rays, 739.
 Action of yeast, 91. *See also* Dextrins, fermentation.
 Adhesive power, 1322, 2475.
 Adsorption by charcoal, 3399.
 Adsorption by ferric hydroxide, 1247.
 Adsorptive properties, 761.
 Aldehydic nature, 444.
 Analytical examination, 1933, 1942, 1947-1948, 1951, 1957, 1960, 1966, 1973, 1975.
 Ash, 1947, 1951, 1957, 1960, 1973.
 Atomic weight, 992.
 Barium compounds, 267, 290, 313, 992, 1462, 1820, 2375.
 Colloidal behavior, 915, 1257, 1299, 1304.
 Coloration with orcin, 681.
 Coloration with phenols, 692.
 Coloration with resorcin and zinc chloride, 686.
 Conductivity, 382.
 Crystallization, 542, 627, 1276.
 Cupric reducing power, 161, 666, 702, 1872, 1966, 2461.
 Decomposition point, 1135.
 Detection, 1803, 1806, 1811-1812, 1816, 1819-1820, 1845, 1848, 1864.
 Detection in honey, 1820, 1837, 1862, 1868, 1887.
 Detection in presence of glycogen, 1870.
 Detection in presence of gum arabic, 1799, 1805, 1808, 1823, 1855, 1866.
 Determination, 1462, 1464, 1502, 1507, 1609, 1635, 1647, 1698.
 Determination in barley, 1453.
 Determination in beer, 1470-1471, 1479, 1574, 1694.
 Determination in beer worts, 1612, 1883.
 Determination in bread, 1915.
 Determination in chocolate, 1526.
 Determination by colorimetric methods, 785.
 Determination in malt, 1453.
 Determination in narcotic extracts, 1596.
 Determination in presence of gum and glycogen, 1457.
 Determination in sugar mixtures, 1441, 1480-1482, 1484-1485, 1487, 1489-1490, 1492, 1506, 1511-1513, 1517, 1527, 1543, 1559, 1589, 1650-1651, 1699, 1791, 1806.
 Dialysis, 1820.
 Dielectric constant, 1288.
 Distillation with sodium bicarbonate, 800.
 Distillation in vacuo, 460.
 Electrical migration, 382.
 Elementary composition, 2377.
 Emulsifying action, 1280.
 Enzymic hydrolysis, 41, 154, 181, 189, 220, 290, 302, 308, 359, 364.
 Ethers and esters, 1044-1103. *See also* individual ethers and esters.
 Fermentation, 234, 298, 308, 325, 1129, 1937, 3221, 3231, 3236, 3246, 3253, 3259, 3263, 3292, 3295, 3297-3298, 3349.
 Fixation of nitrogen, 1199.
 Glucose content, 1937.
 Gold number, 1228, 1234, 1247.
 Heat of combustion, 1208.
 Heat of formation, 1208.
 Heat of solution, 1207.
 Heat of steeping (wetting) (Quellung), 1284.
 History, 25, 2409.
 Influence on crystallization of water, 786.
 Influence on decomposition of hydroxylamine, 1274.

Dextrins, continued.

Influence on photochemical decoloration of dyes, 2482.
 Influence on precipitation of Fe, Cr and Al, 750.
 Influence on solution of chromium in acids, 713.
 Iodine reaction, 25, 31, 40-41, 370, 382, 706, 785, 863, 866, 872, 912, 924, 941, 946, 970.
 Lead compounds, 992-993.
 Manufacture, 2175, 2189, 2233, 2235-2236, 2260, 2263, 2266, 2295, 2325, 2328, 2331, 2335, 2339, 2372-2412. *See also* Dextrins, preparation.
 Mildew formation, 823.
 Molecular weight, 298, 308, 359, 382, 443, 457, 997, 1235, 1238, 1243, 1260, 1267, 3102.
 Molecular weight by osmotic pressure methods, 1214, 1242, 1247-1248.
 Odor, 804.
 Optical properties, 1200.
 Optical rotation, 28, 41, 153, 161, 310, 382, 699, 1267, 1589, 1957, 1960, 1966.
 Precipitation with salts, 706.
 Preparation, 1148. *See also* Dextrins, manufacture; Starch sizes, preparation.
 Preparation by acid hydrolysis, 3, 12, 25, 161, 202, 671, 2381, 2383, 2386, 2399, 2405.
 Preparation by enzymic hydrolysis, 153, 161, 181, 189, 202, 268, 279, 286, 290, 296, 359, 362, 671, 2387.
 Preparation by torrefaction and acids, 153, 785, 1966, 2134, 2373-2377, 2380, 2391-2395, 2397, 2401, 2403-2404, 2406, 2408, 2410-2411, 2575.
 Purification, 2384, 2387.
 Rate of diffusion, 1192, 1235, 1243, 1260.
 Reducing power, 382, 390.
 Solubility, 41, 1259.
 Solubility in alcohol, 1189.
 Solubility in pyridine, 1264.
 Specific heat, 1284.
 Steam distillation, 804.
 Sugar content, 1937, 1947, 1951, 1960.
 Synthesis, 467, 471, 477, 481, 500, 684.
 Ultramicroscopic examination, 1231.
 Uses, 2401, 2437-2439, 2470, 3437.
 Use as adhesive, 2479, 2496, 2524, 2545, 2556.
 Use in calico printing, 2396.
 Use in conservation of meats, 2464.
 Use as finishing materials, 2476, 2485.
 Use in ink, 2373.
 Use as reducing agents, 2461.
 Use as sizing materials, 2490, 2551-2552, 2562-2563, 2571.
 Use as vehicles for narcotic extracts, 2456.
 Viscosity, 359, 382, 1234, 1247, 1267, 1322-1323, 1957, 1960.
 Water content, 1945, 1947, 1951, 1957, 1960, 1973.
 Dextrins in honey, 717.
 Dextrose, 111, 130, 134-136.
 Formation by enzymic hydrolysis, 178, 180, 189, 195, 197, 220, 230, 236, 238, 244, 288, 302, 305, 307-308, 311-312, 314, 329-330, 340, 354, 361, 371, 373, 379, 400, 409, 612, 3213, 3301.
 Diamalt, 343, 3457.
 Diamylose, 629-630, 634, 637, 641, 644, 646.
 Diastafor, 2485, 2511, 2538, 3441, 3443-3445, 3453-3454, 3456, 3458, 3469, 3479, 3485.
 Diastafor extra, 3456.
 Diastasolin, 328, 338, 3448.
 Dihexosan, 495, 503, 614.

E

Erythramylum, 785, 1880.
 Erythroamylose, 598-599, 602-603.
 Erythroamyllum, 159.

Erythrodextrin, 69, 119, 128, 159, 176, 179, 240, 247-248, 250, 267, 283, 298, 313, 359, 370, 382, 448, 451, 459, 537, 593, 679, 689, 706, 739, 785, 793, 911-912, 1025, 1028, 1077, 1155, 1165, 1205, 1242, 1870, 2665, 3399.

Acetyl compound, 179, 1077.

Erythrodextrin in maize, 1916, 2155.

Erythrogranulose, 537.

F

Farina, 1296.

Farinol, 3462.

Farinose, 525, 550.

Feculose, 1081, 2488, 2543.

Fermasol, 3471, 3475.

Fireproof starch, 2454, 2468, 2486.

Formic acid from starch, 652, 656, 670.

Formic acid from starch by fermentation, 3237, 3305, 3323.

Fructose, 1337.

Fulminam, 1135.

Fungus amylases, 290, 3216-3349.

Furfural from starch, 710-711, 1018.

G

Gallisin, 54-55, 66, 108.

Gloy, 2552.

Glucose, 197, 220, 230, 236, 1886.

Glucosan, 471.

Polymerization, 477.

Glucose, 1-2, 19, 21, 27, 30, 33-34, 39, 42, 78, 82, 94, 109, 112, 114, 118, 126, 2163, 2458, 2557.

Analysis, 44, 73, 137.

Turbidity, 76-77.

Glucose β -glucoside, 119.

Glucosin, 108.

Glutinous starches, 807-808, 927.

Granulase, 2655.

Granulose, 459, 528, 533, 537, 548, 550, 1704. *See also* Amylose; Beta-amylase.

"Grenz-dextrin," 308. *See also* Residual dextrin.

H

Hemi-cellulose, 605, 608, 1871B. *See also* Amylo-cellulose; Starch cellulose.

Hexaamylose, 629-630.

Hexahexosan, 494.

Hexatriose, 606.

Hexosan, 499.

Humus from starch, 774.

Hyacinth starch, 2124.

Hydrocyanic acid from starch, 1037.

I

"Insoluble" amylase, 2749.

Iso-diamylose, 630.

Iso-maltose, 67, 69, 83, 113, 119, 222, 226, 229, 234, 237, 239-240, 243-244, 247-250, 253, 255, 257-264, 266, 270-271, 274, 278, 293, 308, 311, 316, 320, 408-409, 444, 450-451, 1886.

Isomers, 263.

Preparation, 231.

Iso-triamylose, 484, 630.

K

Kashiwagi amylase, 356.

Koji diastase, 2902, 3065, 3224-3225, 3231, 3286, 3301, 3332.

L

Lactic acid from starch by fermentation, 3230, 3300, 3323.

Lactose, 376.

Laevoglucosan, 465-466, 473, 482, 498, 1271.

Polymerization, 467, 471, 477, 485, 500, 1271.

Laevulinic acid from starch, 696.

Laevulose, 83, 86, 454.

Lead amylate, 990, 994.

Leicom, 658, 2378-2379, 2442.

Lichen starch, 887.

Lintner's soluble starch, 3172. *See also* Soluble starch.

Lucon, 2477.

M

Malt syrup, 384, 401.

Maltine, 2593, 2598, 3042.

Maltodextrin, 86, 179, 185, 196, 216, 224, 226, 237, 239, 245, 252, 255, 277, 287-288, 292-293, 298, 308, 311, 325, 404, 425, 442, 717, 779, 1071, 3033, 3246. *See also* Amyloins.

Acetyl derivative, 179.

Barium compound, 442.

Maltodextrinic acid, 287.

Maltose:

Formation by acid hydrolysis, 63, 70, 84-85, 91, 107, 112, 114, 117, 119, 124, 126, 149.

Formation by enzymic hydrolysis, 149, 153, 161, 163-164, 170, 172, 176, 179-180, 183, 191, 333, 385, 390, 403, 411, 414-416, 2642.

Manioc starch. *See* Cassava starch.

Maranta starch. *See* Arrowroot starch.

Mazam, 1324.

Mercabides from starch, 712.

Meta-maltose, 265.

Methylated starch, 475, 480. *See also* Starch, methylation.

Molecular weight, 474.

Mould amylases, 3216-3349.

N

Nitrogen trioxide from starch and nitric acid, 675.

Novo fermasol, 3481.

O

Oat starch, 215, 2694.

Octaamylose, 631.

Oxalic acid from starch, 990, 1009.

Oxyoleic acid-starch-sulphuric acid ester, 1062.

Oxypyruvic acid from starch, 1079.

"Ozone" starch, 1223.

P

Palm starch, 2104, 2107.

Paraffined starch, 788.

Pea starch, 1369.

Pearl starch, 1322, 2544.

Pentoses from starch, 749.

Polyzime, 3331, 3467, 3474.

Porphyrodextrin, 238.

Potato starch, 89, 167-168, 317, 474, 594, 620, 741, 1006, 1196, 1293, 1395, 1400, 1415, 1790, 1792, 1798, 1801, 1834, 1846-1847, 1850, 1857, 1943, 1952, 1963, 1984, 2017, 2474, 2502, 2515, 2552, 2573, 3142.

Potato starch, continued.

Determination in bread, 1832, 1850-1852.
 Manufacture, 2121, 2123, 2128, 2162, 2164, 2167-2169, 2171-2173, 2178, 2182-2186, 2194, 2199, 2201, 2211-2212, 2214, 2217, 2234, 2242-2243, 2245, 2259, 2271, 2275, 2298, 2305-2307, 2312, 2322-2324, 2330-2331, 2335, 2342, 2347, 2349, 2352-2353, 2358-2360, 2364, 2370-2371, 2583.
 Manufacture, machinery, 2176, 2231.
 Primary dextrins, 265.
 Pylalose, 173, 180.
 Pyrocatechin from starch, 673.
 Pyrodextrin, 2380.

R

Rapidase, 3484-3485.
 Residual dextrin from enzymic hydrolysis (Grenz-dextrin), 145, 150-151, 209, 211, 240, 288, 291, 297, 308, 322, 331, 345, 387, 406, 416, 420, 425, 430, 443, 558, 612, 664, 1370, 2765.
 Reversion amylose, 573.
 "Rhenania," 2982.
 Rice starch, 52, 540, 620, 625, 723, 741, 762, 768, 796, 998, 1827-1828, 1863, 1944, 2515, 2552, 2573, 3177.
 Manufacture, 2125, 2181, 2189, 2204, 2209, 2215, 2240, 2249, 2267, 2273, 2311, 2356.
 Rose amylose, 370.
 Rush nut starch, 1993.
 Rye starch, 215, 766, 813, 1349, 1822, 1839, 1841, 1852, 1857, 2761.

S

Saccharogenase, 2756.
 Sage starch, 620, 1296, 2003, 2041, 2509, 2515, 2550, 2552.
 Scammony root starch, 2007.
 Secondary dextrins, 265.
 Soluble starch, 52, 288, 448, 452, 586, 589, 658, 679, 698, 708, 755, 778, 785, 1023, 1038, 1041, 1071, 1125-1168, 1188, 1219, 2299, 2477, 2479, 2519, 2838, 3121, 3140, 3152, 3177.
 Influence of electrolytes upon precipitation, 755, 778.
 Optical rotation, 1221.
 Preparation by acid treatment, 176, 1127-1128, 1145, 1149, 1151, 1160-1162, 1164-1165, 3172.
 Preparation by enzymic treatment, 146, 176, 181.
 Sorghum starches, 1345, 2113.
 Soy bean starch, 1434, 1502.
 "Stärko," 1989.

STARCH:

Absorption spectra, 1210.
 Acetylation, 452, 476, 490, 611, 614, 629-630, 635-636, 641-642, 796, 809, 956, 1058-1060, 1063, 1072, 1075, 1077, 1080, 1085, 1093, 1095.
 Acid hydrolysis, 1-138, 380, 515, 540, 593, 626, 664, 671, 680, 740, 757, 925, 1069, 1575, 1979, 2163, 2208, 2974, 2989. *See also* Starch, determination, saccharimetric methods, 1575.
 Acid hydrolysis, acetic acid, 6, 8, 29, 37, 53, 102.
 Acid hydrolysis, fluosilicic acid, 92.
 Acid hydrolysis, formic acid, 59, 102.
 Acid hydrolysis, glyoxylic acid, 1069.
 Acid hydrolysis, hydriodic acid, 98-101.
 Acid hydrolysis, hydrobromic acid, 98-99.
 Acid hydrolysis, hydrochloric acid, 8, 34, 43, 48, 50, 53, 60, 62, 70, 80, 88, 90, 98-99, 107, 110, 122-123, 131-132, 202, 664, 943.
 Acid hydrolysis, hydrofluoric acid, 125.
 Acid hydrolysis, hypochlorous acid, 81.
 Acid hydrolysis, lactic acid, 104.

Starch, continued.

Acid hydrolysis, malonic acid, 103.
 Acid hydrolysis, nitric acid, 8, 95-96, 106.
 Acid hydrolysis, organic acids, 52, 57.
 Acid hydrolysis, oxalic acid, 8, 47, 67, 69, 83, 86, 103, 119.
 Acid hydrolysis, phosphoric acid, 8.
 Acid hydrolysis, sulphuric acid, 1-5, 7-8, 10-11, 13, 15-16, 19-20, 22-23, 25, 34, 38-39, 45-46, 52, 89, 93, 515, 664.
 Acid hydrolysis, sulphurous acid, 17, 68, 71.
 Acid hydrolysis, tartaric acid, 47, 104.
 Acid hydrolysis, dextrin-glucose ratio, 35, 40.
 Acid hydrolysis, historical, 6, 8-9, 13-14.
 Acid hydrolysis, influence of electrical currents, 2684.
 Acid hydrolysis, lecture demonstration, 38.
 Acid hydrolysis, rate of, 46, 95-96, 98-106, 115, 123, 133.
 Acid hydrolysis, sugars other than dextrose and maltose, 54-55, 58, 63, 65-67, 83, 86, 95, 108, 113, 122, 126.
 Acid hydrolysis, theory, 9-11, 14, 19, 21, 27, 32, 36.
 Acid hydrolysis, volume effects, 740.
 Acid hydrolysis under pressure, 32, 46, 62, 72, 79-80, 89.
 Acidity, 685, 724, 998, 1003, 1293, 1943, 1953, 2385, 2838.
 Action of acid permanganate, 1010.
 Action of "activin," 1041.
 Action of albumenoids, 701.
 Action of alcoholic alkalies, 1971.
 Action of alkalies, 178, 453, 528, 566, 584, 588, 797, 808, 813, 973, 989-1007, 1129, 1134, 1137, 1142, 1144, 1146-1147, 1159, 1251, 1307-1308, 1314, 1350-1351, 1361, 1379-1380, 1795, 1813, 1822, 1830, 2436, 2553, 2555, 2559, 2575, 3177. *See also* Starch, alkali compounds.
 Action of alkaline mercuric oxide, 712.
 Action of allyl bromide, 1099.
 Action of ammonia, 991, 995, 2714.
 Action of aniline, 674.
 Action of aqua regia, 776.
 Action of benzyl chloride, 1090.
 Action of bleaching powder, 1022.
 Action of blood serum, 238, 249.
 Action of borax, 1314.
 Action of boric acid, 1314.
 Action of bromine, 688.
 Action of calcium chloride, 1191, 1337, 1564, 1711, 1713-1715, 2540.
 Action of carbon disulphide and NaOH, 1078, 2553.
 Action of chlor-sulphonic acid, 676, 1098.
 Action of chloracetic acids, 1074, 1094, 1494.
 Action of chloral hydrate, 716, 747, 805, 1339, 1342, 1420, 1829.
 Action of chloric acid, 1022.
 Action of chlorine, 1008.
 Action of chlorine peroxide, 1036.
 Action of chloroform and zinc chloride, 704.
 Action of chlorous acid, 1008.
 Action of chromic acid, 1018, 1022, 1025, 1420.
 Action of concentrated nitric acid, 675, 693, 1009, 1017, 1044, 1051, 1061, 1092.
 Action of concentrated sulphuric acid, 703, 1045, 1065.
 Action of cupro-ammonium, 528, 659, 661, 665, 697, 766, 1442, 1508, 1700.
 Action of diazo-methane, 1102.
 Action of dichromate, 1038.
 Action of dyes. *See* Starch, dyeing.
 Action of electrical currents and forces, 669, 691, 729, 734, 751, 757, 2723. *See also* Starch solutions, electrophoresis.
 Action of ethylene diamine and copper hydroxide, 799.

Starch, continued.

- Action of ferric chloride, 1420.
- Action of fluorine, 1015.
- Action of formaldehyde, 797, 963-988. *See also* Amyloform.
- Action of formic acid, 1074, 1151.
- Action of heated gelatin, 1139.
- Action of heated glycerin, 441-442, 445, 448, 484, 494, 611, 1136, 1138, 1143, 1161.
- Action of high pressures, 1206.
- Action of hydrogen bromide, 454, 707, 738.
- Action of hydrogen chloride, 738, 2405, 2714, 2724.
- Action of hydrogen peroxide, 573, 1013, 1016, 1027-1033.
- Action of hydrogen peroxide and ferric chloride, 1032.
- Action of hypochlorous acid, 1039.
- Action of iodide-quinine-bisulphate solutions, 815.
- Action of iodine. *See* Starch, iodine reaction.
- Action of iodine bromide, 879.
- Action of iodine chloride, 879.
- Action of iodolactic acid, 1825.
- Action of lauryl acid chloride, 1096.
- Action of lead nitrate and iodine, 657.
- Action of lead subnitrate, 989.
- Action of light, 660, 662.
- Action of magnesium chloride, 2460, 2462.
- Action of manganese dioxide, 1022.
- Action of manganese dioxide and sulphuric acid, 652.
- Action of manganese peroxide and HCl, 656.
- Action of microorganisms, 3216-3349.
- Action of nitrogen iodide, 865.
- Action of oxidizing agents, 573, 800, 1008-1043, 1147, 2575, 2584, 3359.
- Action of palmitic acid chloride, 1097.
- Action of permanganate, 1012, 1014, 1022, 1035, 1037, 1497.
- Action of persulphates, 1340.
- Action of phenols, 692, 695, 1420, 2586A.
- Action of phenylhydrazine, 973.
- Action of phosphorus oxychloride, 1088.
- Action of picric acid, 1538.
- Action of platinum black, 727.
- Action of Prussian blue, 651.
- Action of Purdy's solution, 1420.
- Action of resorcinol, 556, 692, 716.
- Action of silver salts, 583.
- Action of sodium chloride solutions, 678.
- Action of sodium hypobromite, 1020.
- Action of sodium peroxide, 1023, 1161.
- Action of sodium salicylate, 1839, 1841-1842.
- Action of soluble chlorides, 1348.
- Action of soluble sulphates, 1348.
- Action of stearic acid chloride, 1097.
- Action of sulphur dioxide, 71.
- Action of tannin, 652A, 655, 1807.
- Action of thiocyanates, 593, 625, 1337.
- Action of tin chloride, 1130.
- Action of triphenyl-chlor-methane, 1101.
- Action of ultra-violet rays, 742, 749, 754, 1286.
- Action of various substances, 737.
- Action of water at high temperatures, 453, 670, 673, 682, 685, 722, 1125, 1150, 1161, 2575.
- Action of X-rays, 739.
- Action of zinc chloride, 1129, 1142, 1522, 1676.
- Adhesion to boundary of liquids, 1265.
- Adhesive power, 1322, 2502, 2553, 2589.
- Adsorption of amylases, 2881, 3100, 3102, 3104.
- Adsorption of barium sulphate, 760-761.
- Adsorption of carbon dioxide, 687.
- Adsorption of cupro-ammonium, 766.
- Adsorption of dyes, 720, 728, 735, 813, 1352, 1417, 1420, 2446, 2451.
- Adsorption of fatty acids, 811.
- Adsorption of gases, 810.

Starch, continued.

- Adsorption of halogens, 2989.
- Adsorption of iodine. *See* Starch, iodine reaction.
- Adsorption of pepsin, 367, 723.
- Adsorption of soaps, 2943, 2961.
- Adsorption by strontium carbonate, 769.
- Adsorption of sugar, 783.
- Adsorption of water. *See* Starch, water content.
- Adsorptive properties, 600, 667, 687, 697, 720, 728, 733, 735, 738, 741, 743-746, 756, 760-766, 769, 772-773, 778, 783, 798, 810-811, 898, 1001, 1004-1005, 1287.
- Adulterations, 1931-1932, 1934-1935, 1944, 191982-1983.
- Alkali compounds, 588, 636-637, 1159, 1683.
- Analytical examination, 1924-1989, 2117, 2131.
- Ash, 52, 581, 594, 601, 607, 828, 1293, 1384, 161832, 1865, 1927-1928, 1953, 2117, 2144.
- Barium hydroxide compounds, 636, 778, 1024. *See also* Starch, determination, barium precipitate methods.
- Bleaching, 2256, 2262.
- Bromomagnesiyl derivative, 810.
- Calcium hydroxide compounds, 1462.
- Carbonization. *See* Carbon from starch.
- Chemical hysteresis, 743-744, 762.
- Chemistry, reviews, 44, 178, 245, 247, 256, 294, 335, 419, 422, 437, 439, 444, 450, 458, 461-472, 476, 483, 491-492, 496-497, 606, 643, 767, 782, 817.
- Coagulative action, 1273.
- Colloidal behavior, 562, 565, 567-569, 574, 581, 623, 743, 753, 767, 778, 808, 915, 999, 1202, 1212, 1228, 1272, 1278, 1295, 1300, 1379-1381.
- Coloration with diphenylamine, 692.
- Coloration with dyes, 720, 728, 735, 813, 131417, 1420, 1847, 1852, 1857, 1869, 2451. *See also* Colored starches.
- Coloration with orcin and sulphuric acid, 681.
- Coloration with phenols, 692, 695.
- Coloration with resorcinol and zinc oxide, 715.
- Combination with soaps, 1255.
- Comparison of different varieties, 813, 823, 8904, 1309, 1336, 1338, 1342-1346, 1349, 131409, 1419, 1740, 1790, 1792, 1795, 1798, 181804, 1813, 1822, 1824, 1826, 1828, 1830-181834, 1839, 1841-1842, 1847, 1849, 1852, 181859, 1861, 1863, 1869, 1871, 1877, 1927, 202515, 2582.
- Contraction coefficient, 1245.
- Conversion in bread, 370, 374, 689, 705, 718, 76765, 772, 775, 817, 824, 827, 1266, 1328, 131433, 1452, 1832, 1838, 1851-1852, 1915, 246267, 2471-2473, 2510, 2587, 2937, 3442, 3443447, 3451, 3457, 3463, 3473, 3477, 3483.
- Conversion in the brewery and distillery, 140-150, 152, 154-155, 160, 192, 194, 203-208, 211, 216-217, 222, 225-226, 229, 237, 242, 276, 281, 284-285, 289, 300, 309, 312, 329, 335, 347, 366, 388, 397-398, 866, 1267, 121470, 2719, 2804-2806, 3033, 3223, 3246, 323254, 3258, 3260, 3264, 3267, 3291, 3293, 32302, 3313-3315, 3342-3343, 3393.
- Crystalline degradation products. *See* Amylose formed by bacterial action.
- Crystalline nature, 536, 758, 1202, 1261, 1268, 1277, 1411, 1952.
- Cupric reducing power, 702, 973, 1165.
- Decomposition point, 787.
- Deflocculation, 753, 759.
- Deminceralization, 581, 749.
- Detection, 1807, 1811, 1814, 1817, 1833, 1836, 181843, 1848, 1854-1856.
- Detection in cocoa and chocolate, 1797, 1800, 181821.
- Detection in hemp cloth, 1794.

Starch, continued.

Detection in indigo, 1796.
 Detection in leaves, 1844.
 Detection in milk, 1809-1810.
 Detection in paper, 2495.
 Detection in paprika, 1829.
 Determination, 450, 1437-1789, 2268, 2270, 2274, 2277, 2282, 2285, 2290, 2292, 2296.
 Determination, barium precipitation methods, 1458-1460, 1462-1463, 1465-1466, 1468-1469, 1494, 1698, 1760-1764.
 Determination, colorimetric methods, 1610, 1889.
 Determination, comparison of methods, 1756-1789.
 Determination, fermentation methods, 1499, 1602.
 Determination, gravimetric methods, 1522, 1671-1699, 1788.
 Determination, influence of pentosans, 1477, 1541, 1616, 1626, 1630, 1656, 1663, 1666, 1763-1764, 1766, 1769.
 Determination, interferometer methods, 769, 1246, 1669.
 Determination, iodine methods, 1494, 1700-1719.
 Determination, iodine colorimetric methods, 1702-1703, 1705, 1707, 1713, 1715-1717, 1719, 1824, 1921.
 Determination, iodine precipitation methods, 1494, 1704, 1706, 1708, 1710-1715.
 Determination, polarimetric methods, 1293, 1517-1569, 1773-1774, 1788, 1909, 1911-1912, 1993, 2068, 2075, 2094.
 Determination, refractometric methods, 1253, 1626, 1633, 1773, 1853, 3196.
 Determination, saccharimetric methods, 87, 363, 1570-1670, 1756, 1763-1764, 1768, 1873.
 Determination, specific gravity methods, 1530, 1684, 1720-1756, 1772, 1775, 2022.
 Determination in baking powders, 1688.
 Determination in bananas, 1544, 2089.
 Determination in barley, 1453, 1531-1532, 1537, 1542, 1545, 1555-1556, 1584, 1617-1618, 1621, 1630-1632, 1636, 1659, 1667, 1670, 1758, 1773, 1783, 2023, 2068, 2075, 2087.
 Determination in bran, 1505, 1595, 2094.
 Determination in bread, 1452, 1586.
 Determination in cattle foods, 1604.
 Determination in cereals, 1451, 1469, 1521, 1563, 1582, 1587-1588, 1597, 1599, 1613, 1626, 1633, 1681-1682, 1760-1761, 1763, 1767, 1769, 1873.
 Determination in chocolate and cocoa, 1449, 1541, 1568, 1592, 1624, 1628-1629, 1643. ●
 Determination in cinnamon, 1541.
 Determination in confectionary, 1639, 1890.
 Determination in corn, 1623, 1626.
 Determination in drugs, 1498, 1606, 1825.
 Determination in fish products, 1645.
 Determination in flour, 1523, 1529, 1909.
 Determination in fodder, 1775-1776.
 Determination in foods, 1605, 1609, 1642, 1653, 1775-1776.
 Determination in leaves, 1593, 1717.
 Determination in malt, 1453, 1472, 1557, 1617-1618, 1621.
 Determination in margarine, 1662.
 Determination in marmalades, 1719.
 Determination in mash, 1455.
 Determination in meat products, 1474, 1483, 1486, 1491, 1508, 1528, 1536, 1627, 1638, 1640, 1645-1646, 1679-1680, 1693, 1782, 1788, 1899.
 Determination in mustard, 1778, 1835-1836, 1897-1898.
 Determination in navy beans, 2145.
 Determination in oats, 1781.
 Determination in opium, 1606.
 Determination in paper, 1501, 1507, 1551, 1554, 1647-1648, 1671, 1673, 1675, 1786.
 Determination in pectin juices, 1718.

Starch, continued.

Determination in pepper, 1541, 1601, 1775, 1882.
 Determination in potatoes, 1437, 1443-1445, 1518-1519, 1530, 1546, 1558, 1579, 1587, 1637, 1660, 1683-1684, 1720-1755, 1767, 1772, 2022.
 Determination in rice, 1468, 1761.
 Determination in rye millings, 1553.
 Determination in sausage, 1475, 1483, 1486, 1522, 1547, 1561, 1565, 1569, 1576-1577, 1583, 1713.
 Determination in soap, 1493, 1672.
 Determination in spent grains, 1496, 1510, 1560, 1709, 1715.
 Determination in spice, 1498.
 Determination in starch factory residues, 1516, 1604, 1785.
 Determination in vegetables, 1461, 1661.
 Determination in wheat, 1654, 1659, 1667, 1696, 2286.
 Determination in wheat millings, 1553.
 Determination in wood, 1777, 1888, 1919.
 Determination in yeast, 1446, 1525, 1594, 1610, 1678, 1685-1686, 1706, 1770.
 Dextrinization by desiccation, 752.
 Dielectric constant, 1288.
 Diffusion, 1215, 1253.
 Distillation in vacuo, 465-466, 468, 471, 498, 636.
 Distillation with hydrogen, 820.
 Distillation with sodium bicarbonate, 800.
 Dry distillation, 694, 763, 812, 820.
 Drying, 752, 770, 1161, 1949, 1956, 1969, 1985, 1988, 2231.
 Dyeing, 720, 728, 735, 813, 818, 1352, 1417, 1420, 1847, 1852, 1857, 1869, 1871B, 2451.
 Elasticity, 1296.
 Elementary composition, 27, 48-49, 53, 435, 440, 560, 1126, 1232, 2377.
 Emulsifying action, 1280.
 Enzymic hydrolysis, 86, 139-433, 453, 584, 609, 612, 614, 636, 652A, 664, 671, 729, 740, 757, 925, 927, 943, 1368, 2635, 2694, 3311, 3435A.
 Enzymic hydrolysis, conductivity effects, 349.
 Enzymic hydrolysis, equilibrium point, 209, 213, 235, 300, 345, 353, 374, 381, 396, 402, 404, 417, 420-421, 2765, 2880, 3291.
 Enzymic hydrolysis, influence of acidity or alkalinity, 166, 168, 178, 200, 295, 322, 332, 339, 391, 393, 396, 418, 2674, 2802, 2823, 2849-2850. *See also* Amylases, optimum pH.
 Enzymic hydrolysis, influence of concentrations, 157, 165-167, 177, 235, 299, 337, 353, 365, 369, 381, 391, 393, 396, 2700, 2737, 2802, 2945, 2978.
 Enzymic hydrolysis, influence of electrical currents, 2684, 2686.
 Enzymic hydrolysis, influence of polarized light, 806, 821, 3084.
 Enzymic hydrolysis, influence of pressure, 177, 392, 394.
 Enzymic hydrolysis, influence of surface tension, 377, 2877.
 Enzymic hydrolysis, influence of temperature, 169, 175, 177-178, 235, 237, 269, 329, 396, 2700, 2737, 2823, 2880. *See also* Amylase, action of heat.
 Enzymic hydrolysis, rate of, 157, 228, 303, 306, 310, 315, 326, 331, 336-337, 344, 350-353, 355, 358, 363, 369, 383, 391, 396, 399, 431, 589, 2700, 2880, 2919, 2996.
 Enzymic hydrolysis, reversion, 342, 377.
 Enzymic hydrolysis, sugars other than maltose, isomaltose and dextrose, 164, 260-261, 265, 304, 307, 376, 409, 3397.
 Enzymic hydrolysis, theory, 32, 162, 184, 341, 352, 433, 453, 2881, 2884, 2919, 3100, 3102.
 Enzymic hydrolysis, thermal effects, 275, 346, 368, 680.
 Enzymic hydrolysis, volume effects, 740.

Starch, continued.

- Enzymic hydrolysis by emulsin, 414.
 Ethers and esters, 1044-1103, 2496. *See also* individual ethers and esters.
 Fat compound, 515, 540, 593, 604, 619, 625-626, 1979.
 Fat content, 1953, 1979, 2117.
 Fermentation, 3216-3349. *See also* Acetic acid from starch by fermentation; Formic acid from starch by fermentation; etc.
 Fireproofing, 2454, 2468, 2486.
 Formation by enzyme action, 2717, 2719, 2721-2722, 2728.
 Freezing, 1194, 1241, 1354-1355, 1383-1384, 1410, 1742, 1745.
 Gelatinization, 1335-1353, 1370.
 Gelatinization temperatures, 193, 280, 747, 1293, 1336, 1341, 1343-1347, 1349, 1353, 1420, 2113.
 Gelatinization with alkalis, 1350-1351.
 Gelatinization with calcium chloride, 1337.
 Gelatinization with chloral hydrate, 716, 747, 1339, 1342.
 Gelatinization with formaldehyde, 971.
 Gelatinization by heat, 625, 747, 1290-1291, 1335, 1338, 1343-1347, 1349, 1353.
 Gelatinization with I-KI solutions, 808.
 Gelatinization with inorganic salts, 596, 747, 1341, 1348, 1350-1351.
 Gelatinization with magnesium chloride, 1348.
 Gelatinization with magnesium sulphate, 1348.
 Gelatinization with persulphates, 1340.
 Gelatinization with potassium acetate, 1337.
 Gelatinization with potassium bromide, 858.
 Gelatinization with potassium iodide, 858.
 Gelatinization with resorcinol, 556, 716.
 Gelatinization with thiocyanates, 593, 625, 1337.
 General chemical characteristics, 651-828.
 General physical characteristics, 1188-1304.
 Gluten content, 1925.
 Gold number, 808, 1228, 1234, 1251, 1293.
 Heat of combustion, 560, 636, 642, 680, 1205, 1208, 1216, 1232, 1293.
 Heat of formation, 1208.
 Heat of solution, 1207.
 Heat of steeping (wetting) (Quellung), 714, 1207, 1209, 1213, 1218, 1222, 1227, 1236, 1250, 1279.
 History, 109, 2435, 2488, 2495.
 Hydration, 743-746, 756, 762, 771-773, 786, 1213, 1290, 1335, 1723.
 Hydrolysis by formaldehyde, 972-988.
 Hydrolysis by hydrogen peroxide, 1013, 1016, 1027-1032.
 Hydrolysis by platinum black, 727.
 Hydrolysis by salts, 369, 595, 983, 1104-1124, 3007, 3057. *See also* Artificial amylase.
 Hygroscopicity, 52, 1193, 1266, 1269, 1279, 1287, 1294.
 Induced oxidation, 1042.
 Industrial sources, 1990-2161. *See also* Starch content of various plants.
 Inflammability, 1254, 1263, 1297.
 Influence on albumin solutions, 1197.
 Influence on autoxydation of sugars, 780.
 Influence on crystallization of water, 786, 1298.
 Influence on decomposition of ammonium and urea nitrates, 802.
 Influence on decomposition of hydroxylamine, 1274.
 Influence on evolution of gases from solution, 1249, 1256, 1262.
 Influence on photochemical decoloration of dyes, 2482.
 Influence on soil fertility, 2483.
 Influence on soil reaction, 2529.
 Iodine reaction, 507, 523, 526-529, 532, 548, 571, 589, 592, 603, 623, 625, 636, 652A, 657, 679, 709, 714, 789, 808, 829-962, 1338, 1417-1418, 1420, 1425, 1793, 1797, 1800, 1802, 1807, 1810, 1814, 1844, 1857, 1869, 2754. *See also* Starch, iodine coloration; Starch, determination, iodine methods; Starch iodide.
 Iodine reaction, influence of albumin, 871, 944.
 Iodine reaction, influence of alcohol, 892.
 Iodine reaction, influence of chloral hydrate, 1342.
 Iodine reaction, influence of electrolytes, 846, 856, 886, 899, 913, 925-926, 935-936, 944, 949.
 Iodine reaction, influence of proteins, 930, 3166.
 Iodine reaction, influence of temperature, 831, 847, 849, 853-854, 856, 858-862, 872-873, 878, 886, 894, 909, 925, 936, 940.
 Iodine reaction, influence of water, 832, 870.
 Iodine reaction, mass relationships, 919, 925, 934, 947-948, 950.
 Iodine reaction, sensitivity, 830, 837, 863, 894, 909, 913, 935, 940, 942.
 Iodine reaction, theory, 386, 537, 797, 954.
 Iodine reaction as indicator, 833, 912, 939, 1144, 1153, 1160, 1176-1177, 1182.
 Ketonic nature, 454.
 Lactic acid content, 1929.
 Linolic acid content, 626.
 Manufacture, 77, 79, 594, 1998, 2049, 2052, 2058, 2069, 2071, 2106, 2162-2371, 2448, 2454.
 Manufacture, centrifugal machinery, 2174, 2187-2188, 2197, 2359.
 Manufacture, drying machinery, 2196, 2231, 2244, 2273, 2339, 2345, 2360.
 Manufacture, electrical methods, 2293.
 Manufacture, fermentation methods, 2271, 2297.
 Manufacture, machinery, 2191, 2246, 2314, 2363.
 Manufacture, racking machinery, 2246, 2248, 2338.
 Manufacture, rasping machinery, 2194, 2224, 2238, 2271.
 Manufacture, settling machinery, 2240-2241, 2248, 2255, 2257, 2259, 2265, 2337, 2340.
 Manufacture, sieving machinery, 2195, 2213, 2240, 2273, 2280, 2338.
 Manufacture, use of acid, 2257, 2269, 2276.
 Manufacture, use of alkali, 2249, 2255, 2261, 2276, 2280, 2356.
 Manufacture, use of hydrofluoric acid, 2254.
 Manufacture, use of sulphuric acid, 2199.
 Manufacture, use of sulphurous acid, 2294.
 Manufacture, washing machinery, 2185, 2305, 2338.
 Manufacture, water, 2225.
 Methylation, 470, 474, 476, 480, 489, 614, 1094, 1102.
 Mildew formation, 823.
 Molecular constitution, 74, 288, 308, 414-415, 434-504, 635, 1066, 3298.
 Molecular diameter, 1225, 1227, 1278.
 Molecular solution volume, 1240.
 Molecular weight, 120, 493, 582, 636, 997, 1074, 1076-1077, 1222, 1225, 1227, 1253.
 Molecular weight by colorimetric methods, 457, 460.
 Molecular weight by freezing point depression, 1223, 1244, 3118.
 Molecular weight by osmotic pressure, 592, 714.
 Nitrogen content, 480, 523, 587, 1328, 1620, 18971, 2117.
 Oleic acid content, 625.
 Optical properties, 1220.
 Optical refraction, 1224, 1229.
 Optical rotation, 178, 504, 683, 988, 999, 1024, 1038, 1129, 1217, 1221, 1381. *See also* Starch, determination, polarimetric methods.
 Palmitic acid content, 593, 626.
 Phosphorus compound, 562, 581-582, 587-588, 603, 609, 618, 620-621, 1088, 1316, 1379.
 Phosphorus content, 493, 555, 557, 562, 572, 582, 587, 589, 592, 598, 609, 620, 949, 112838.

Starch, continued.

Precipitation by ammoniacal lead acetate, 781.
 Precipitation by iodine, 2754.
 Precipitation by iron, 789.
 Precipitation by ptyalin, 790.
 Precipitation by salts, 3177.
 Preservation, 652B.
 Purification, 386, 412, 582, 625, 1383-1384, 1971, 2163.
 Red iodine coloration, 867, 876-877, 880, 882, 889, 911, 917, 927-928, 930.
 Removal from textiles, 2580. *See also* Amylases, use in desizing of textiles.
 Retrogradation. *See* Starch solutions, coagulation.
 Saponification numbers, 620.
 Silicon content, 601, 618.
 Similarity to agar, 478.
 Similarity to cellulose, 661, 663, 805.
 Similarity to glycogen, 364, 399, 475, 493, 602, 612, 633, 635, 731, 800, 1028, 1093, 1870.
 Sizing values, 2449, 2585.
 Solubility, 1188-1191.
 Solubility in formamide, 1244.
 Solubility in pyridine, 1264.
 Specific gravity, 178, 560, 988, 1196, 1218, 1233, 1239, 1293-1294. *See also* Starch, determination, specific gravity methods.
 Specific heat, 1218, 1226, 1271, 1284.
 Specific inductive capacity, 1293.
 Specific volume, 1293.
 Strontium hydroxide compounds; 1462.
 Sublimation, 482, 1302.
 Substitutes, 1974, 1977-1978, 1980, 1989, 2511, 2518, 2536.
 Sugar content, 1929, 1932.
 Sulphonation, 676.
 Tenacity, 1204.
 Tensile strength, 1296.
 Terminology, 1958, 1981.
 Thickening power, 2144.
 Torrefaction, 488, 654, 710, 785, 794. *See also* Dextrins, preparation by torrefaction.
 Ultramicroscopic examination, 1237.
 Uses, 2081, 2179, 2310, 2325, 2347, 2435-2591.
 Use as adhesive, 2295, 2369, 2478-2479, 2496, 2502, 2504, 2507, 2524, 2537, 2545-2546, 2548, 2553, 2555, 2568, 2575, 2589.
 Use as adjunct in bread-making, 2471-2473, 2510, 2587.
 Use as adjunct in brewing, 2463, 2489, 2513-2514, 2525, 2574, 2577.
 Use in calico printing, 2442.
 Use as fertilizer, 2483, 2529.
 Use for finishing leather, 2480.
 Use as finishing material, 2476-2477, 2491.
 Use as food, 1972, 1982-1983, 2006, 2008.
 Use in laundrying, 1972, 1974, 1977-1978, 1982-1983, 2284, 2301, 2441, 2459, 2465, 2508, 2528, 2533, 2545A, 2552A, 2554, 2565A, 2573, 2583A.
 Use on paper pasting machines, 2369.
 Use as size for photographic paper, 2443, 2445.
 Use as sizing material, 2455, 2462, 2500, 2512, 2546, 2548, 2569.
 Use in sizing of paper, 660, 1501, 2436, 2460, 2481, 2484, 2487-2488, 2493, 2497-2499, 2501, 2503-2506, 2531, 2543, 2561, 2565-2566, 2572, 2575, 2586, 2591.
 Use in sizing of paper, history, 2492, 2495.
 Use in sizing of textiles, 1204, 1287, 1318, 1321, 1325, 1327, 1794, 2301, 2361, 2444, 2449, 2486, 2509, 2515, 2517, 2520-2523, 2526, 2530, 2532, 2534-2535, 2538-2539, 2541-2542, 2544, 2552, 2558-2559, 2562, 2564, 2569-2571, 2576, 2578-2579, 2581, 2584-2585, 2588, 2590, 3460.
 Use in sizing of textiles, history, 2488.
 Washing, 594.

Starch, continued.

Water content, 592, 743-746, 752, 756, 762, 764-765, 771-773, 784, 1213, 1218, 1226, 1266, 1269, 1279, 1287, 1293, 1720-1755, 1924, 1927, 1930, 1938-1939, 1945-1946, 1949, 1952-1953, 1955-1956, 1959, 1964-1965, 1969, 1985, 1988, 2117, 2230.
 X-ray examination, 1268, 1270, 1277, 1282-1283. *See also* Amylodextrin, X-ray examination.
 Starch acetate, 1024, 1058-1060, 1063, 1072, 1075, 1081, 1084, 1091, 1093, 1095. *See also* Feculose.
 Halogen reaction, 956.
 Molecular weight, 1072.
 Optical rotation, 1059.
 Viscosity, 1095.
 X-ray examination, 1276.
 Starch adhesives for letters, 1855.
 Starch as adulterant in cocoa and chocolate, 1797, 1821.
 Starch as adulterant in indigo, 1900-1901.
 Starch as adulterant in margarine, 1891.
 Starch as adulterant in mustard, 1835-1836, 1897-1898.
 Starch as adulterant in pepper, 1882.
 Starch as adulterant in preserves, 1896, 1903.
 Starch as adulterant in spice, 1498.
 Starch as adulterant in sugar, 1874.
 Starch as adulterant in yeast, 207, 733, 1770, 1893.
 Starch benzoate, 1024, 1068.
 Starch cellulose, 37, 52, 178, 459, 517, 523, 525, 528, 532, 538, 540-542, 605, 608, 708, 1016, 1140, 1355. *See also* Amylocellulose.
 Starch chloracetate, 1074, 1076-1077.
 Starch content of acorns, 2114, 2129.
 Starch content of *Aldina insignis*, 2149.
 Starch content of *Anthriscus sylvestris*, 2120.
 Starch content of apples, 2844.
 Starch content of arrow root, 1992, 2057, 2158.
 Starch content of *Aspergillus niger*, 1889.
 Starch content of bananas, 2089, 2095, 2115.
 Starch content of barley, 2023, 2028, 2032, 2038, 2068, 2073, 2075-2077, 2087.
 Starch content of *Bassia longifolia*, 2156.
 Starch content of beans, 2145.
 Starch content of brake fern roots, 2130.
 Starch content of bran, 1872, 2094.
 Starch content of bread fruit tree, 2061.
 Starch content of bulrush roots, 2126.
 Starch content of "Bunya Bunya," 2160.
 Starch content of canned foods, 1906.
 Starch content of cassava root, 2044, 2058, 2069, 2071, 2082-2083, 2132, 2150.
 Starch content of cereals, 1873, 1991.
 Starch content of chestnuts, 1997-1998, 2049, 2114, 2116, 2129, 2134, 2206.
 Starch content of "chufa," 2157.
 Starch content of cocoa and chocolate, 1568, 1592, 1624.
 Starch content of coffee, 1878.
 Starch content of colchique bulbs, 1996.
 Starch content of corn, 2012, 2031, 2052, 2054, 2079, 2138-2139.
 Starch content of corn silage, 1912.
 Starch content of dehydrated vegetables, 1908.
 Starch content of different potato varieties, 1732, 1991, 2005, 2016-2017, 2019, 2022, 2027, 2033-2035, 2039-2040, 2050-2051, 2070, 2074, 2078, 2084-2085, 2093, 2151.
 Starch content of *Dolichos multiflorus*, 2103.
 Starch content of durra, 2045, 2119.
 Starch content of egg yolk, 1875.
 Starch content of flaxseed, 1892.
 Starch content of flour, 1909, 1914.
 Starch content of flower bulbs, 2124, 2129, 2353.
 Starch content of fodders, 1881.
 Starch content of *Fritillaria imperialis*, 1995.

- Starch content of fruit juices, 1921.
 Starch content of fungi, 1884.
 Starch content of "gigaro," 2127.
 Starch content of gluten, 1880.
 Starch content of gluten preparations, 1950.
 Starch content of *Icacina senegalensis*, 2131.
 Starch content of Johnson grass, 2135.
 Starch content of linseed meal, 1892.
 Starch content of mace, 1904.
 Starch content of maize pollen, 1920.
 Starch content of marmalades, 1905.
 Starch content of mustard, 1835-1836, 1894, 1897-1898.
 Starch content of *pancratium*, 2000.
 Starch content of pecans, 1913.
 Starch content of pepper, 1601.
 Starch content of potatoes, 2001-2002, 2010-2011, 2014-2015, 2026, 2029-2030, 2036-2037, 2043, 2047-2048, 2056, 2060, 2062-2067, 2072, 2088, 2096, 2102, 2108-2112, 2122-2123, 2128, 2140, 2161, 2219, 2324. *See also* Starch content of different potato varieties.
 Influence of fertilizers, 2013, 2017-2018, 2020-2021, 2024-2025, 2046, 2090-2091, 2099, 2101, 2105, 2136, 2141, 2147, 2153.
 Starch content of Quaker oats, 1910.
 Starch content of rice, 1999, 2125, 2356.
 Starch content of rush nut, 1993.
 Starch content of scammony root, 2007.
 Starch content of sorghum, 2113.
 Starch content of sorghum juice, 1917-1918, 1922.
 Starch content of sugar beets, 1895.
 Starch content of sugar palms, 2104, 2107.
 Starch content of sweet potatoes, 2092, 2118, 2301.
 Starch content of "*Tacca umbrarum*," 2106.
 Starch content of tree ferns, 2146, 2152.
 Starch content of various foods, 1876-1877, 1879.
 Starch content of various plants, 1572, 1908, 1911, 1990, 2009, 2098.
 Starch content of voandzou, 2055.
 Starch content of weeds, 1907.
 Starch content of wheat, 1654, 2100, 2159, 2286.
 Starch content of wine, 1923.
 Starch content of wood, 1888, 1919.
 Starch content of "zeamin," 2148.
 Starch dust, ignition temperature, 1252, 1254, 1263, 1293, 1297.
 Starch dust explosions, 1203, 1252, 1258, 1292, 2343, 2367-2368.
 Starch factories, description, 2173, 2193, 2202, 2221, 2237, 2287, 2301, 2304, 2321, 2329, 2367-2368.
 Starch factory residues, 2177, 2184, 2198, 2203, 2207, 2217, 2227, 2239, 2250, 2252-2253, 2303, 2315, 2413-2434.
 Starch factory waste waters, 2413-2434.
 Starch films, 1287, 1296.
 Starch formate, 1074, 1081.
 Starch glyoxylate, 1069.
 Starch granules:
 Action of amylase, 187, 190, 200, 214, 223, 286, 291, 297, 310, 341, 362, 736, 981, 1368, 1858, 1871A, 2651, 3451.
 Action of the fermentation process, 1396.
 Action of heat, 1408.
 Artificial preparation, 709, 714, 1140, 1372.
 Behavior under polarized light, 596, 778, 806, 818-819, 821, 1195, 1198, 1201, 1343, 1353, 1398-1399, 1404, 1414, 1417, 1420, 1425-1426, 1429, 1432, 1831, 1833, 1846, 1850.
 Components, 201, 505-526, 778, 1052, 1136.
 Components, iodine colorations, 507.
 Electrical charge, 1275.
 Formation of mould growths, 795.
 Homogeneity, 535.
 Lamellae, 535-536.
 Layers, 514, 518, 583.
Starch granules, continued.
 Mechanical destruction, 600, 817-818, 1132-1133, 1188, 1206, 1282.
 Micellae, 535, 537.
 Microscopic examination, 505, 508, 517, 590, 775, 836, 927, 1390, 1395-1436, 1813, 1828, 1835, 1849-1850, 1858-1859, 1865, 1877, 192281.
 Photomicrographs, 778, 1419, 1422-1423, 1431, 1434, 1842, 2113, 2124, 2126, 2129, 2515-2516, 2561.
 Size, 1293, 1406, 1415-1416, 1420, 1423, 1428, 1433, 1514, 1703, 1867, 1877, 1952, 2126, 2151, 2212.
 Structure, 509, 519-520, 543-545, 553-554, 577-578, 583, 728, 1282, 1350, 1390, 1395-142561.
 Starch hydrates, 786, 1290.
 Starch iodide, 834, 836, 838, 850, 852, 854, 857, 868, 885, 890-891, 895, 897, 910, 915, 918, 928, 931.
 Absorption spectra, 947, 959.
 Action of amylase, 873.
 Action of bromine, 851.
 Action of chlorine, 848, 851.
 Action of dyes, 926.
 Action of furfural, 930.
 Action of nascent hydrogen, 873.
 Action of sunlight, 872, 874, 886, 932.
 Action of ultra-violet rays, 922.
 Action of various reagents, 829, 855-856, 886.
 Action of various salts, 846, 899.
 Action of X-rays, 934.
 Antiseptic properties, 937.
 Colorimetric measurements, 919, 921, 924.
 Composition, 890, 893, 896, 900-901, 904, 907, 944-945, 947, 951, 962.
 Compounds, 884.
 Decoloration by charcoal, 840.
 Dessication, 873.
 Detection in Prussian blue, 1796.
 Dialysis, 905.
 Electrical conductivity, 916, 957.
 Incineration, 869, 873.
 Precipitation by Vanino's reagent, 931.
 Preparation, 835, 839, 841-842, 929, 951.
 Similarity to cycloacetals of acetol, 955.
 Similarity to the iodide of lanthanum acetate, 955.
 Similarity to iodocholeic acid, 883-884, 902-903.
 Solubility, 831.
 Starch laurate, 1096.
 Starch nitrate, 1009, 1012, 1044, 1046, 1049, 1052, 1054-1055, 1057, 1061, 1064, 1067, 1073, 1079, 1081-1082, 1086-1087, 1092, 1133.
 Composition, 1057, 1067, 1070-1071, 1086.
 Hygroscopicity, 1082.
 Ignition point, 1082.
 Molecular weight, 1071, 1073.
 Optical rotation, 1057.
 Viscosity, 1082.
 Starch nitrate as explosive, 1050, 1053, 1056, 1070.
 Starch nitrate for waterproofing textiles, 1044.
 Starch palmitate, 1097.
 Starch paste, liquefaction, 220, 722, 725-726, 825, 1026, 1163, 1370, 1382, 2767, 2855, 3167, 3250, 3312, 3326. *See also* Amylases, enzyme theory.
 Starch phosphoric acids. *See* Amylophosphoric acids.
 Starch sizes, preparation, 2436, 2559, 3444, 3463, 3466.
 Starch solutions, 557, 565, 567, 570, 590, 607, 931, 1152, 1188, 1215.
 Ageing, 581, 599, 790, 863, 1316-1317, 3152.
 Boiling point, 1212.

Starch solutions, continued.

Coagulation, 350, 589, 593, 596, 807-808, 818, 1351, 1354-1394. *See also* Amylocoagulase.
 Dialysis, 402, 592, 938, 988, 1137.
 Electrical conductivity, 567, 581, 588, 592, 609, 669, 1161, 1316.
 Electro-viscous effect, 1329.
 Electrophoresis, 493, 574, 597, 599, 613, 625, 731, 1293.
 Filtration, 565, 567-568, 1152.
 Filtration velocity, 1333.
 Interfacial tension, 1280.
 Preservation, 678, 762, 881, 944, 1145, 1169-1187.
 Surface tension, 808, 1229, 1255, 1280, 1294, 2877.
 Tyndall phenomena, 921, 1215.
 Ultra-filtration, 574, 600, 625.
 Vapor tension, 1293.
 Viscosity, 178, 493, 581, 588-589, 592, 600, 609, 808, 988, 1161, 1234, 1294, 1305-1334, 1353, 1423, 2516, 2582, 2768, 3040, 3094, 3168.
 Viscosity, influence of formaldehyde, 972, 988.
 Starch stearate, 1097.
 Starch sulphuric acids, 1045, 1047-1048, 1062, 1065-1066, 1098.
 Starch viscose. *See* Starch xanthate.
 Starch xanthate, 1078, 1083, 1103, 2553, 2555.
 Starching preparations. *See* Starch, use in laundering.
 Sweet potato starch, 2092, 2118, 3419.
 Manufacture, 2301, 2353.

T

Taka-diastase, 305, 336-337, 343, 363, 379, 2612, 2690, 2857, 2968, 2983, 2993-2994, 2999, 3005, 3042, 3045, 3117, 3162, 3191, 3223, 3261-3262, 3274, 3455.
 Taka-koji, 3296, 3461.
 Tapioca starch, 1802, 2003, 2117, 2509, 2550, 2552.
 Tetraamylose, 629-630, 638, 644.
 Tetrahexosan, 503.

Tree fern starch, 2146, 2152.
 Triamylose, 484, 629-630, 640, 642, 645-647, 649.
 Trihexosan, 484, 494-495, 499, 612, 614.
 Acetylation, 484, 494.
 Triphenyl methyl starch, 1101.

U

"Universal" starch, 2558, 2564.
 Urea from starch, 1035.

V

Valeric acid from starch by fermentation, 3277.

W

Wheat starch, 53, 168, 517, 620, 765, 771, 813, 824, 1193, 1218, 1226, 1328, 1330, 1349, 1353, 1356, 1415, 1798, 1801, 1804, 1822, 1827, 1839, 1841, 1852-1853, 1857, 1867, 1953, 2515, 2552, 2586.
 Manufacture, 2180, 2205, 2223, 2266, 2286, 2327, 2362.

X

Xyloidin, 1009, 1044, 1046, 1049-1050, 1052, 1054, 1057, 1061, 1064. *See also* Starch nitrate.

Z

Zamia starch, 2154.
 "Zeanin" starch, 2148.

INTERESTING RECENT ADDITIONS

INDUSTRIES AND INDUSTRIAL ARTS

* **Aquino**, Francisco Radler de. Aquino's "newest" sea and air navigation tables for solving all problems by inspection. The simplest and readiest in solution, the safest and the most exact. Annapolis, Maryland: U. S. Naval Institute, 1927. vi, 117, vii-liv p. diags., tables. 8°. \$5.00. **VXFB (Stack 3)**

Author is a commander in the Brazilian navy.

"Most of the problems of celestial sea and air navigation depend upon the solution of a right-angled spherical triangle, and as the three principal problems are solved by dividing the spherical triangle into two right-angled triangles, they all may be easily and readily solved *without logarithms* by aid of the appended tables in only 90 pages, which, however, were especially arranged for facilitating the determination of lines of position and the identification of celestial bodies at sea and in the air." — *Introduction*.

Bazzoni, C. B. *Kernels of the universe*. New York: George H. Doran Company, 1927. 189 p. illus. 16°. \$1.25. **PAW (117)**

The physicist, in a series of informal porch talks to the man of business and the man of religion, discusses the material universe, the periodic table, electricity and matter, atoms, waves and the transfer of radiant energy, the quantum theory, the Bohr hydrogen atom, the heavier atoms, structure of the nucleus, and cosmic considerations. Author is Professor of Experimental Physics in the University of Pennsylvania.

Blake, G. G. *History of radio telegraphy and telephony*. London: Radio Press, Ltd., 1926. xix, 425 p. illus. 8°. 25s. **TTF (121)**

Reference work including many now almost forgotten schemes and inventions, with an unusually complete index and a bibliography of 403 titles.

"Many of these early inventions, though of little practical use in their present form, are exceedingly ingenious and well worthy of careful consideration by the modern experimenter, who may find ideas therein which he can apply to some new invention." — *Preface*.

Reviewed in *Wireless world*, April 13, 1927.

* **Block**, Berthold. *Die sieblose Schleuder zur Abscheidung von Sink- und Schwebestoffen aus Säften, Laugen, Milch, Blut, Serum, Lacken, Farben, Teer, Öl, Hefewürze, Papierstoff, Stärkemilch, Erzschlamm, Abwässern...* Leipzig: Otto Spamer, 1921. 271 p. illus. 8°. (Monographien zur chemischen Apparatur. Heft 4.)

VOF (Monographien) (119)

Theory and practice of the centrifugal separator in detail.

Caplin, Jessie F. *Knitting, its products and processes*. A concise survey of knit goods manufacture from the raw material to the finished merchandise. New York: Dry Goods Economist, 1927. 93 p. illus. 12°. \$2.00. **VLD (121)**

Briefly characterizes wool, silk, cotton, linen, rayon, and fiber combinations and describes the fundamentals of knitting. Useful to the educational departments of large stores, to home economics departments of schools, and to the general reader who desires a simple comprehensive outline.

Ceretti, G. *Aerial cableways, a handbook for constructors and engineers, giving rules, formulae and useful technical data for the building and maintenance of aerial cableways*, translated by William John Walker. London: E. and F. Spon, Ltd.; New York: Spon and Chamberlain, 1927. vii, 111 p. diags. 16°. 5s. **VFG (122)**

"Signor Ceretti... is the founder of the firm Ceretti and Tanfani, of Milan, the well-known experts in the construction of aerial cableways, of which concern has been the moving spirit for about 35 years." *Iron and coal trades review*, April 8, 1927.

Reviewed in *Engineering journal*, April, 1927. *Engineer*, July 22, 1927.

Duke, Donald. *Airports and airways; construction, operation and maintenance*. New York: The Ronald Press Company, 1927. xii, 172 p. illus. 8°. \$5.00. **VDY (123)**

The author, a first lieutenant in the United States Air Corps, discusses the need of air ports, their location, size, construction, equipment, operation and maintenance; airways; intermediate landing fields; hangars and mooring towers; facilities for seaplane operations; aids to aerial navigation; maps; bulletins; aerial identification of cities and towns; lighting equipment; aviation gasoline and lubricants; regulations; and social aspects.

"The effort has therefore been made to supply... a readable book, interesting alike—but from different viewpoints—to the member of a municipal airport committee or to the man in the street." — *Preface*.

* **Eckelt**, J. L. Carl, and Otto GASSNER. *Projektierungen und Apparaturen für die chemische Industrie. I. Gruppe: Nitrocellulose, synthetischer Campher, Pulver*. Leipzig: Otto Spamer, 1926. 158 p. illus. 8°. Paper, 15 marks; bound, 18 marks. **VOF (119)**

Confined to planning of plant and descriptions of apparatus.

"For the American reader the book is mainly interesting as affording a comparison of American and German practice. On the whole, there does not seem much to be learned from ours and require much labor." — *Hugo Schlatter in Industrial and engineering chemistry*, April, 1927.

* **Fritz**, Felix. *Das Linoleum und seine Fabrikation mit besonderer Berücksichtigung seiner Geschichte, Eigenschaften und Verwendung*. Berlin: Alfred Weber, 1926. 374 p. illus. 8°. 25 mks. **VOF (119)**

Details of manufacture with numerous footnotes, references and patent citations.

* **Garrard**, Charles C. *Electric switch and controlling gear, a handbook on the design, manufacture and use of switchgear and switchboards in central stations, factories and mines*. London: Ernest Benn, Ltd., 1927. xiv, 783 p. 3. ed. rev. and enl. illus. 8°. £3.3s. **VGM (124)**

Second edition, 654 p., was published in 1920. Not revised to correspond with recent developments. Nearly one hundred pages are given to various official regulations and specifications.

"There is little doubt that Dr. Garrard's book will continue to enjoy the reputation it has deserved."

Industries and Industrial Arts, continued.

attained. So many matters are included in the general subject of switchgear that the task of preparing or revising a treatise on this subject is by no means easy, and in spite of scantiness of treatment in some parts, and of redundancy in others, the book is generally a very able and comprehensive presentment of a difficult subject by a recognized authority." — *World power*, June, 1927.

Also reviewed in *Engineer*, June 17, 1927; *Electrical review*, London, June 3, 1927.

Gilbert, Albert T. Gas meters, their construction, use, fixing, inspection, and maintenance. London: Crosby, Lockwood and Son, 1927. xvi, 223 p. illus. 12°. 7s.6d.

VOL (119)

Includes improvements in construction since the publication of the 1st edition, 1925, 189 p. (See *New technical books*, 1925, v. 10, p. 49-50.)

Reviewed in *Engineer*, July 22, 1927.

* **Gottlob, Kurt.** Gottlob's Technology of rubber, authorized English edition translated and revised from the German edition of 1925 by Joseph L. Rosenbaum. London: Maclaren and Sons, Ltd., 1927. xvi, 350 p. illus. 8°. 42s.

VMV (121)

The chemistry of the pure natural hydrocarbon is followed by chapters on origin, preparation, properties, examination, mixing and filling, vulcanization, mechanical testing of soft rubber, chemical analysis of vulcanized rubber, and synthetic rubber. There is also consideration of the various products made from hot and cold vulcanized rubber.

"The translation is excellent...the scientific phases of rubber are clearly expressed and most theories are mentioned... The descriptions of factory practice are far from modern... One cannot resist the conclusion that the work has been written and translated purely from the German and English viewpoints, and that it will not appeal to the American reader." — *William C. Geer in Industrial and engineering chemistry*, July, 1927.

Haas, Arthur. Atomic theory, an elementary exposition; translated by T. Verschoyle. London: Constable and Company, Ltd., 1927. xiv, 222 p. illus. 8°. 10s.6d.

PAW (117)

"The title of this book is somewhat misleading; it is neither a systematised treatise of atomic theory, nor is it elementary in the ordinary sense of the word. It is a short concise review of the organic relationship of modern physical discoveries to one another and to the atomic theory, with the quantum and electron theories as supplying the means of co-ordination." — *Engineer*, April 29, 1927.

* **Halse, George W.** Oil and retortable materials, a handbook on the utilisation of coal, torbanite, cannell and oil shale. London: Charles Griffin and Company, Ltd., 1927. vi, 146 p. 12°. 7s.6d.

VHV (117)

Outlines the essential features of the various processes for obtaining liquid fuels, with a chapter on future supplies.

Hardy, A. C. American ship types; a review of the work, characteristics, and construction of ship types peculiar to the waters of the North American continent. New York: D. Van Nostrand Company, Inc., 1927. xi, 262 p. illus. 8°. \$5.00.

VXH (121)

Contents: Outline geographical survey. Great Lakes and inland waterways. Survey of American ship types. All types of coastwise shipping. U. S. bay and sound shipping. Mass transportation of hu-

manity. U. S. railroads as shipowners. Four big groups of ferryboats. Towboats for various duties. River pushboats and packet boats. Transportation of freight cars. Great Lakes and canal freighters. Great Lakes passenger traffic. Three big groups of dredges. Light vessels and light tenders.

Reviewed in *Marine engineer and motorship builder*, July, 1927; *Shipbuilding and shipping record*, July 14, 1927.

Harrison, J. L. Management and methods in concrete highway construction. New York: McGraw-Hill Book Company, Inc., 1927. ix, 242 p. illus. 8°. \$3.00.

VDG (121)

Amplification and correlation of data obtained by the United States Bureau of Public Roads, with special reference to efficiencies and costs.

* **Herzog, R. O.** Chemische Technologie der organischen Verbindungen. Heidelberg: Carl Winter, 1927. xii, 997 p. illus. 8°. Paper, 66 mks.; bound, 70 mks.

VOE (119)

Forty-five experts contribute to this voluminous work, the first edition of which appeared in 1912 (732 p.). Deals with tars and bitumens; oils, fats, and waxes; resins and rubber; carbohydrates; fermentation industries; proteins; coal tar dyes; essential oils and perfumes; pharmaceutical products; explosives; photographic preparations; organic acids; solvents; acetylene and its products; formaldehyde; and textiles. Has plans of plant and factory layouts.

"It is not surprising to find that many sections are far too short and inadequate to be of much help to the technical chemist, and in almost every case the information is considerably less detailed than in the corresponding sections of Ullmann's Enzyklopädie." — *Chemistry and industry*, May 6, 1927.

Also reviewed in *Journal of the Institution of Petroleum Technologists*, June, 1927.

* **Hill, E. P.** Rotary converters, their principles, construction and operation. London: Chapman and Hall, Ltd., 1927. xiii, 329 p. illus. 4°. 25s.

VGI (121)

Copiously illustrated and diagramed work on principles and operating characteristics, written from an operation and commercial standpoint. Detail design is not included. Messrs. F. E. Hill and E. Coad contribute a section on the transformer. Bibliography.

Reviewed in *World power*, May, 1927; *Engineer*, April 29, 1927.

Horsfall, R. S., and L. G. LAWRIE. The dyeing of textile fibres. London: Ernest Benn, Ltd., 1927. x, 415 p. 8°. 28s.

VLG (121)

"The fibres are dealt with in the order — cotton, bast, artificial silks, wool and silk. Each is described sufficiently fully to give the dyer a working knowledge of the fibre; the manufacturing processes each undergo, before reaching the dyehouse, are outlined, as are also the uses to which the fibre is put... The processes of dyeing are treated very fully, with ample practical details... The pitfalls attendant upon the testing of dyestuffs are discussed in the thirteenth chapter." — *Industrial chemist*, June, 1927.

Lamb, John. The running and maintenance of the marine Diesel engine, a reference book for marine engineers and others qualifying as engineers of motor vessels, giving practical suggestions from sea experience. London: Charles Griffin and Company, Ltd., 1927. xi, 523 p. 3. ed. revised and enl. illus. 12°. 18s.

VXHG (121)

"The work is one which must appeal alike to the junior motorship engineer or the chief engineer of motorships, while Mr. Lamb's treatment is such that

Industries and Industrial Arts, continued.

the book may be profitably studied by an engineer having no previous knowledge of the running and maintenance of oil engines... An excellent production, the various drawings and diagrams being particularly good, while the author's style is simple and clear."—*Marine engineer and motorship builder*, April, 1927.

Lorentz, H. A. Problems of modern physics; a course of lectures delivered in the California Institute of Technology... Edited by H. Bateman. Boston: Ginn and Company, 1927. vi, 312 p. diagrs. 12°. \$3.60.

PAG (117)

"Each article or section is given a separate number and caption and they follow in a more or less logical sequence presumably much as delivered but without the usual coherence of a book. The problems discussed cover a wide range within the limits of their field, which has to do chiefly with radiation, relativity, and quantum theory. For these subjects the lectures form an excellent introduction."—*Frederick E. Beach in American journal of science*, June, 1927.

* **National Research Council.** International critical tables of numerical data, physics, chemistry and technology, prepared under the auspices of the International Research Council and the National Academy of Sciences... 5 v. v. 2. New York: McGraw-Hill Book Company, Inc., 1927. xvii, 616 p. tables. 4°. Sold only in sets at the rate of \$12.00 the volume. **PKT (119)**

Detailed tabular data covering the properties of a large number of commercial substances: woods, building stones, clays, porcelain, refractories and abrasives, glass, enamels, cements, fuels, asphalt, waxes, explosives, oils, fats, adhesives, textile fibers, rubber and gutta percha, plastics, carbon electrodes, insulating materials, paints and varnishes, and metals, with sections on toxicology of gases and vapors, air conditioning, refrigerating brines, sieves and screens, saccharimetry, and X-ray diffraction. Bibliographical references. Numerous diagrams. For notice of v. 1 see *New technical books*, 1926, v. 11, p. 39.

Reviewed in *Chemical and metallurgical engineering*, July, 1927.

Neon, pseud. The great delusion, a study of aircraft in peace and war, with a preface by Arthur Hungerford Pollen. London: Ernest Benn, Ltd., 1927. xxxix, 288 p. 8°. 12s.6d. **VDY (121)**

Endeavors to show, with numerous data, that "air power" is illusory and "air supremacy" a will-o'-the-wisp; that aircraft for war purposes is a sheer waste of men and money and that commercial long-distance vessels can never be safe or practicable.

* **Obrutschew, W. A.** Die metallogenetischen Epochen und Gebiete von Sibirien. Halle a. S.: Wilhelm Knapp, 1926. 63 p., 1 map. 8°. (Abhandlungen zur praktischen Geologie und Bergwirtschaftslehre. Bd. 6.) 5.50 mks. **VHA (Abhandlungen) (117)**

"Discusses the regional distribution of the deposits of the various periods and sketches the characteristic features of the deposits of each region... Brings out the close genetic connection between orogeny, igneous intrusion and ore deposition... A useful bibliography of one hundred thirty-six titles concludes the volume."—*F. L. Ransome in Economic geology*, 1927, v. 22.

Ransome, Stafford. Cutters and cutter-blocks as used on wood working machinery.

London: Ernest Benn, Ltd., 1927. 176 illus. 12°. 12s.6d. **VFV (12)**

Thorough discussion of theory and practice of cutters for planing and moulding, with excellent diagrams. Chapters on heat treatment, sharpening and sharpening machines, abrasive wheels, and the duties of the "cutter-doctor."

"Will certainly add to the author's reputation for sane writing and perspicuous treatment."—*Illustrated carpenter and builder*, July 1, 1927.

Also reviewed in *Engineer*, July 22, 1927.

Reymond, Arnold. History of the sciences in Greco-Roman antiquity, translated by Ruth Gheury de Bray. New York: E. Dutton and Company [1927]. x, 245 p. 12°. \$2.50. **OAC (11)**

Author is Professor of Philosophy at the University of Lausanne.

The bulk of the book is devoted to a detailed presentation of work of the Greek philosophers followed later by the Romans, who derived their sciences as their other cultures, from the Greeks. The period covered is from the earliest records of Greek philosophy (about 650 B.C.) to the sixth century of the present era... It sets forth in clear and attractive form the data at hand and critical judgments thereon. The translation is well done."—*Henry Leffmann in Journal of the Franklin Institute*, May, 1927.

* **Steffensen, J. F.** Interpolation. Baltimore: The Williams and Wilkins Company, 1927. ix, 248 p. 8°. \$8.00. **OIK (11)**

Attempts to develop only such approximative formulas for which it is possible to derive a remainder term simple enough to permit the calculation of limits to the error involved in the formula. Requires mathematics beyond elementary differential and integral calculus. Author is Professor of Actuarial Science in the University of Copenhagen.

Reviewed in *Nature*, June 25, 1927.

Stewart, Oliver. Aeolus, or the future of the flying machine. London: Kegan Paul, Trench, Trubner & Co., Ltd., 1927. 96 p. 16°. (Today and tomorrow series.) 2s.6d. **VDY (12)**

"I make no attempt to hit upon any sudden revelation which may revolutionize flight. I confine myself to developing lines of progress which have already given some proof of practicability. For determining the general trend of progress I rely upon a utilitarian review of the aeronautical situation. I have avoided leaping into the distant future. Readers will be disappointed to learn that things like inter-planetary voyaging are not dealt with in this booklet."—*Payer*

Svensen, Carl Lars. Drafting for engineers, a textbook of engineering drawing for colleges and technical schools. New York: D. Van Nostrand Company, 1927. xi, 363 p. 8°. \$2.75. **VFE (12)**

Contents: Drafting. Engineering lettering. Engineering geometry. Orthographic projection. The use of dimensioning. Bolts and screws. Working drawings. Engineering sketching. Intersecting surfaces. Development of surfaces. Pictorial drawing sketching. Detail drafting. Computation of volumes from drawings. Piping drawings. Architectural drawing. Structural drafting. Electrical drafting. Technical illustrations and data. Problems and studies.

* **Tolman, Richard C.** Statistical mechanics with applications to physics and chemistry. New York: The Chemical Catalog Company, Inc., 1927. 334 p. 8°. \$7.00. **PBE (1)**

Theory is developed in a logical manner, giving especial attention to the physical concepts employed rather than to mathematical subtleties. The elements

Industries and Industrial Arts, continued.

of classical and quantum mechanics are presented in sufficient measure to serve as a foundation. Special attention has been given to physical-chemical change, since this is the field where statistical mechanics most clearly demonstrates its superiority to thermodynamics. Author is Professor of Physical Chemistry and Mathematical Physics in the California Institute of Technology.

Reviewed in *Journal of the Franklin Institute*, July, 1927; *Industrial and engineering chemistry*, Aug., 1927.

* **Trevor, J. E.** The general theory of the thermodynamics, an introduction to the study of thermodynamics. Boston: Ginn and Company, 1927. vii, 104 p. diagrs. 8°. \$1.60. **PDN (117)**

Designed for students having some acquaintance with the calculus of functions of more than one variable. Deals exclusively with general principles and omits applications. Author is Professor of Thermodynamics in Cornell University.

* **Wall, T. F.** Applied magnetism. London: Ernest Benn, Ltd., 1927. vii, 262 p. diagrs. 8°. 28s. **PGI (121)**

Part 1 deals with principles, including a brief account of the electron theory of magnetism, and consideration of recent efforts to obtain very intense fields. Part 2 treats of representative methods of magnetic testing. Author is head of the Electrical Engineering Department in the University of Sheffield.

Reviewed in *Electrician*, April 29, 1927.

* **Watson, Wilbur J.** Bridge architecture, containing two hundred illustrations of the notable bridges of the world, ancient and modern, with descriptive, historical and legendary text. New York: William Helburn, 1927. 288 p. illus. f°. \$17.50. † **VEK**

Illustrates the art of good bridge design, avoiding technical terms and data as much as possible.

Whitehead, J. B. Lectures on dielectric theory and insulation. New York: McGraw-Hill Book Company, Inc., 1927. vii, 154 p. diagrs. 8°. \$2.50. **VGM (121)**

The Professor of Electrical Engineering in Johns Hopkins University reviews and comments on the various outstanding researches concerning the anomalous properties of dielectrics and the performance of high voltage insulation. Classified bibliography.

Young, George J. The working of unstratified mineral deposits, with a chapter on the haematite ores of Cumberland and Furness by T. S. Durham. London: Ernest Benn, Ltd.; New York: D. Van Nostrand Company, 1927. 466 p. illus. 8°. \$7.00. **VHL (117)**

Discusses the various types of ore deposits, the mechanics of rock masses, classification and general features of mining methods, mining of narrow and intermediate sized veins, mining of wide ore bodies of the vein type, mining large ore bodies, mining tools and underground structures, and control of mining. Surface or open cut methods are considered in their relation to underground methods. Mr. Young is associate editor of the *Engineering and mining journal*.

Reviewed in *Colliery guardian*, May 20, 1927; *Mining Congress journal*, Aug., 1927.

ART

Ashton, Leigh. Samplers, selected and described with an introduction. London:

The Medici Society [1926]. viii, 14 p., v, 72 pl. 4°. **MOT**

Baum, Dwight James. The work of Dwight James Baum, architect, with a foreword by Harvey Wiley Corbett... & an introduction and commentary text by Matlack Price... New York: W. Helburn, Inc., 1927. 10 l., 191 pl. on 98 l. f°. †† **MQZ**

Bayes, Walter. The art of decorative painting. New York: C. Scribner's Sons, 1927. xii, 268 p. illus. 8°. (Universal art series.) **MLO**

Printed in Great Britain.

Beaufort, Thomas Richard. Pictures & how to clean them; to which are added notes on things useful in restoration work. London: J. Lane [1926]. xi, 202 p. illus. 12°. **MBK**

Binyon, Laurence. Chinese paintings in English collections. Paris: G. Vanoest, 1927. 68 p., 64 pl. illus. f°. † **MAG**

Blum, André. A short history of art from prehistoric times to the present day, for the use of students and general readers, translated from the French of André S. Blum... Edited and enlarged by R. R. Tatlock... London: B. T. Batsford, Ltd. [pref. 1926.] xiv, 291 p. illus. 8°. **MAD**

Buckley, Wilfred. European glass; a brief outline of the history of glass making, with notes on various methods of glass decoration, illustrated by examples in the collection of the author... with a foreword by Bernard Rackham... and with an essay on Dutch glass engravers by Dr. Ferrand Hudig. London: E. Benn, Ltd., 1926. xxxvi, 96 p., 161, 104 pl. 4°. **MPW**

Chadwick, Luie M. Fashion drawing & design; a practical manual for art students and others. London: B. T. Batsford, Ltd. [1926.] xi, 262 p. illus. 8°. **MME**

Clifford, Chandler Robbins. The junk snapper; the adventures of an antique collector... New York: Macmillan Co. [cop. 1927.] 5 p.l., 277(1) p. illus. 8°. **MAVC**

Clute, Eugene. The treatment of interiors. New York: Pencil Points Press, Inc., 1926. 200 p. illus. f°. (The pencil points library.) † **MLO**

Curtis, Elizabeth Gibbon. Gateways and doorways of Charleston, South Carolina, in the eighteenth and the nineteenth centuries; edited with introduction and notes by Maxwell Kimball and Arthur C. Holden. New York: Architectural Book Publishing Co., Inc. [cop. 1926.] xiii p., 68 numb. l. illus. 4°. **MRR**

Eberlein, Harold Donaldson, and R. W. RAMSDALL. Small manor houses and farmsteads in France, with an introduction by Leigh French, jr.; having a frontispiece in colour and 253 illustrations in half-tone.

Art, continued.

Philadelphia & London: J. B. Lippincott Company; New York: The Architectural Record Company, 1926. xx, 303 p. illus. 4°.

MQWF

Fry, Roger Eliot. Transformations; critical and speculative essays on art. London: Chatto & Windus, 1926. viii, 230 p., 36 pl. illus. 4°.

†MA

Contents: Some questions in esthetics. Art and the state. Culture and snobbism. Some aspects of Chinese art. Fra Bartolommeo. The Seicento. J. S. Sargent. London sculptors and sculptures. Book illustration and a modern example. Speculations in Languedoc. Vincent van Gogh. Seurat. On some modern drawings. Plastic colour.

Gask, Norman. Old silver spoons of England; a practical guide for collectors. London: H. Jenkins, Ltd., 1926. xviii, 21-189 p. illus. 4°.

MNO

Glass, Frederick J. Sketching from nature; a practical treatise on the principles of pictorial composition. London: B. T. Batsford, Ltd. [1925.] viii, 176 p. illus. 8°.

MBB

Gossop, Robert Percy. Advertisement design. London: Chapman and Hall, Ltd., 1927. xxxiii, 253 p. illus. 8°. (Universal art series.)

MDW

Jourdain, M. English decorative plasterwork of the Renaissance. London: B. T. Batsford, Ltd. [pref. 1926.] xiii, 258 p. illus. 4°.

MLP

Kilham, Walter H. Mexican architecture of the vice-regal period. New York: Longmans, Green and Co., 1927. 221 p., 1 l. illus. 8°.

MQWN

Lebrun, Marie Louise Élisabeth Vigée. The memoirs of Mme Elisabeth Louise Vigée-LeBrun, 1755-1789, translated by Gerard Shelley. London: J. Hamilton, Ltd. [1926.] 217 p. illus. 8°.

MCO

Longnon, Henri Auguste, and F. W. HUARD. French provincial furniture; foreword by Richardson Wright, with 71 illustrations and a map. Philadelphia: J. B. Lippincott Co., 1927. 166 p., 1 l. illus. 8°.

MOF

Malmö Museum, Malmö, Sweden. The modern decorative arts of Sweden, by Erik Wettergren... Published by the Malmö Museum. [Malmö, 1926.] 204 p. illus. 4°.

MNE

English translation by Tage Palm.

Mather, Frank Jewett. Modern painting; a study of tendencies... New York: H. Holt and Co. [cop. 1927.] xvi, 385 p. illus. 8°.

MC

Monson-Fitzjohn, G. J. Quaint signs of olde inns. Illustrated by C. M. Rounding. London: H. Jenkins, Ltd., 1926. 157 p. illus. sq. 8°.

MLT

Newcomb, Rexford. The Spanish house for America, its design, furnishing, and garden; with a frontispiece in colour and 97 plates of Spanish houses and their details. Philadelphia & London: J. B. Lippincott Co., 1927. 164 p. illus. 4°.

MRGK

Piers, Harry. Robert Field, portrait painter in oils, miniature and water-colours and engraver. New York: F. F. Sherman, 1927. xiv p., 1 l., 202 p., 1 l. illus. 8°.

MCV (Field)

Rackham, Bernard. Early Netherlands maiolica, with special reference to the tiles at The Wyne in Hampshire. London: G. Bles [1926.] xiv, 136 p. illus. 4°. †MPGH

Read, Herbert. English stained glass. London: G. P. Putnam's Sons [1926.] xviii, 259 p. illus. 4°.

†MRY

Roerich, Nikolai Konstantinovich. Himalaya, a monograph; articles by Frances R. Grant, Mary Siegrist, George Grebenstchikoff, Ivan Narodny, and "Banners of the East," by Nicholas Roerich, with 24 color-plates and 78 halftones. New York: Brentano's [cop. 1926.] 210 p. illus. f°. †MCZ

Sprague, Elizabeth, and CURTISS SPRAGUE. How to design greeting cards. London: J. Lane [1926.] 62 p. illus. 8°.

MDW

Verneuil, Ad., and M. P. VERNEUIL. Kalléidoscope, ornements abstraits; quatre-vingt-sept motifs en vingt planches composés, par Ad. et M.-P. Verneuil. Pochoirs de J. Sauté. Paris: A. Lévy [1926.] 1 l., 20 col'd pl. f°.

††MLD

Waugh, Elizabeth, and EDITH FOLEY. Collecting hooked rugs... New York & London: The Century Co. [cop. 1927.] xi, 140 p. illus. 8°.

MOP

THE COOKERY OF ETCHING

Books on technique, old and new, recently acquired

The exhibition — "Experimenters in Etching" — now on view in the Print Gallery (Room 321) of the Library, is designed to serve etchers and also to meet the general and natural interest of the public in "how the thing's done." Obviously, it may lead to reading on the subject.

The present list of recent additions to the Print Room's literature on the technique of etching gives a slight indication of the large number of writings on the subject. Arranged chronologically, these few titles cover nearly two centuries, but the earliest book is antedated by over a hundred years in the Library's collection. Seven languages, moreover, are represented in this little lot of books, which points the way to further material on the Print Room's shelves.

Sculptura-historico-technica: or, The history and art of engraving... Extracted from Baldinucci, Florent le Comte, Faithorne, the Abecedario pittorico, and other authors. London: S. Harding, 1747. xii, 225 p. 32°.

MDI

Fokke, Arend. De graveur, behelzende eene beknopte handleiding tot de daktylio-

The Cookery of Etching, continued.

glyphia, of graveerkunst in edele gesteenten, het stempelsnijden... Benevens de beschrijving en afbeelding der werktuigen tot deze kunsten gebezigt wordende. Uit de nieuwste uitlandsche schrieveren, en volgens de inlichtingen der beste heden-daagsche meesters in deze kunsten, samengesteld door Arend Fokke... [Dordrecht: A. Blussé en Zoon, 1796.] xii, 359 p. illus. 8°. (Volledige beschrijving van alle konsten, ambachten, handwerken... Stuk 13.)

MDI

Meynier, Johann Heinrich. Anleitung zur Aetzkunst; besonders in Crayon und Tuschmanier, nach eigenen praktischen Erfahrungen hrsg. von Johann Heinrich Meynier... Hof: G. A. Grau, 1804. viii, 230 p. illus. 8°.

MDN

Schwarz, Paul Wolfgang. Neue und gründliche Art die Aqua-tinta oder Tuschmanier auf das Geschwindeste ohne alle Unterweisung für sich zu erlernen. Durch mehrjährige Erfahrungen geprüft und hrsg. von Paul Wolfgang Schwarz... Nürnberg: J. E. Seidel, 1805. 97 p., 7 pl. 12°.

MDK

Deleschamps, Pierre. Des mordans, des vernis et des planches, dans l'art du graveur, ou Traité complet de la gravure. Paris: M^{me}. Huzard, 1836. xv, 284 p., 4 fold. pl. 8°.

MDI

Meusnier, Georges. Traité pratique de la gravure à l'eau-forte (paysage et figure)... Paris: H. Laurens, 1891. 137 p. illus. 4°. (His: Bibliothèque d'enseignement pratique des beaux-arts. no. 10.)

MDN

Author's pseud., Karl Robert, at head of title.

Gariazzo, Piero Antonio. La stampa incisa; trattato dell' arte d'incidere all' acqua-forte, al bulino, all'acquafinta, alla maniera nera e di intagliare il legno. Prefazione di Leonardo Bistolfi... Torino: S. Lattes & C., 1907. xvi, 240 p. illus. 16°.

MDI

Pennell, Joseph. Etchers and etching; chapters in the history of the art, together with technical explanations of modern artistic methods. New York: Macmillan Co., 1919. xviii, 367 p. illus. 4°. (The graphic arts series. v. 2.)

† MDN

Abril, Manuel, editor. Aguafortistas. [Madrid: Viuda de P. Pérez, 192-?] 21 p., 33 mounted pl., 1 port. sq. 8°. (Biblioteca Estrella.)

MDN

Hubbard, E. Hesketh, editor. On making & collecting etchings; a handbook for etchers, students and collectors, written by members of the Print Society, and put together and ed. by E. Hesketh Hubbard... London: Ringwood, 1920. 183 p., 1 l. illus. 8°. (Print Society publications. no. 1.)

MDN (Print)

Contents: What is an etching? by M. Henderson. A short history of etching, by E. Ertz. How etchings are made, by E. W. Charlton. Some notes on dry-

point, by P. Smith. How aquatints are made, by Stella Langdale. Supplementary processes: soft-ground, mezzotint, etc., by H. Paton. On the printing of etchings, by R. H. Green. Etchings as decoration, by L. M. Ward. On collecting and storing etchings, by E. H. Hubbard. Books about etching and collecting, by E. H. Hubbard (p. 143-160). Appendix.

Struck, Hermann. Die Kunst des Radierens; ein Handbuch. Berlin: P. Cassirer [1920]. 4 p.l., 279 p. 4. verm. und verb. Aufl. illus. 8°.

MDN

Robins, William Palmer. Etching craft; a guide for students and collectors... with a foreword by Martin Hardie... London: "The Bookman's Journal & Print Collector," 1923. xvi, 243 p. illus. 4°.

MDN

Ligeron, René. La gravure originale en couleurs; préface de H. Le Riche, suivi d'un appendice concernant l'impression par Ch. Leblanc... Paris: Lefranc, 1924. 2 p.l., v, 173 p. illus. 2. ed., rev. & cor. 8°.

MDI

Plowman, George Taylor. Manual of etching, a handbook for the beginner... with an original etching frontispiece and other illustrations by the author. New York: Dodd, Mead and Company, 1924. xiv p., 1 l., 94 p. illus. 8°.

MDN

Lumsden, Ernest S. The art of etching; a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time. Philadelphia: J. B. Lippincott Co., 1925. 376 p. illus. 8°. (New art library.)

MDN

Plates printed on both sides.

Printed in Great Britain.

Preissig, Vojtěch. Barevný lept a barevná rytina; technické posnámky. Díl 1. Praha: Státní tiskárna, 1925. illus. 2. ed., rev. f°.

† MDN

Díl 1 is no. 25 of 50 numbered copies printed, autographed by the author.

LITERATURE

Bopp, Léon. H.-F. Amiel; essai sur sa pensée et son caractère d'après des documents inédits. Paris: F. Alcan, 1926. xix, 373 p. 8°.

NKC

Brown, Ivor John Carnegie. Masques and phases; with an introduction by James Agate. London: R. Cobden-Sanderson [1926]. xv, 229 p. 12°.

NCZ

Castle, Eduard Friedrich Ferdinand. In Goethes Geist; Vorträge und Aufsätze. Wien: Österreichischer Bundesverlag für Unterricht, Wissenschaft und Kunst, 1926. xv, 414 p. tables. illus. 8°.

NFGH

Clark, Cumberland. A study of Hamlet. Stratford-upon-Avon: Shakespeare Head Press, 1926. 167 p. 8°. *NCVF (Hamlet)

Literature, continued.

Coats, Robert Hay. John Galsworthy as a dramatic artist. New York: C. Scribner's Sons, 1926. 4 p.l., 240 p. 12°.

NCC (Galsworthy)

Dexter, Walter. Mr. Pickwick's pilgrimages. Illustrated from the original drawings by "Phiz," and photographs by the author. Philadelphia: J. B. Lippincott Co., 1927. xvi, 224 p. illus. 8°.

NCC (Dickens)

Dickman, Adolphe Jacques. Le rôle du surnaturel dans les chansons de geste. Paris: H. Champion, 1926. xii, 208 p. 8°.

NKG

Dunkel, Wilbur Dwight. The dramatic technique of Thomas Middleton in his comedies of London life... [Chicago, 1926.] 125(1) p. 8°.

NCC (Middleton)

Eppelsheimer, Hanns Wilhelm. Petrarca. Bonn: F. Cohen, 1926. viii, 219 p. 8°.

NNHB

Law, Hugh Alexander. Anglo-Irish literature; with a foreword by A. E. London: Longmans, Green and Co., Ltd., 1926. xviii, 301 p. 12°.

NDM

Lewis, Wyndham. The lion and the fox; the rôle of the hero in the plays of Shakespeare. London: G. Richards, Ltd., 1927. 326 p. 8°.

***NCV**

Liebrecht, Henri, and ALBERT STASSART. Histoire illustrée de la littérature belge de langue française (des origines à 1925). Bruxelles: Vanderlinden, 1926. 454 p. illus. 8°.

NKB

Joint author pseud: Georges Rency, at head of title.

Maes, Pierre. Georges Rodenbach, 1855-1898. Paris: E. Figuière, 1926. 299 p. 12°.

NKC (Rodenbach)

Maync, Harry Wilhelm. Eduard Moerike; sein Leben und Dichten, dargestellt von Harry Maync... Stuttgart: J. G. Cotta'sche Buchhandlung Nachfolger, 1927. xiii, 478 p., 1 port. 3. and 4. ed., rev. and enl. 8°.

NFD (Moerike)

Schoell, Franck Louis. Études sur l'humanisme continental en Angleterre à la fin de la Renaissance... avec une préface par Émile Legouis... Paris: H. Champion, 1926. vii, 268 p. 8°. (Bibliothèque de la Revue de littérature comparée. tome 29.)

NKB (Bibliothèque)

Seillière, Ernest Antoine Aimé Léon, baron. Christianisme et romantisme. Alexandre Vinet, historien de la pensée française; suivi d'un appendice sur Henri-Frédéric Amiel. Paris: Payot, 1925. 2 p.l., (1)8-214 p., 1 l. 8°. (Bibliothèque historique.)

NKC (Vinet)

Welby, Thomas Earle. A study of Swinburne. New York: George H. Doran Company [cop. 1926]. viii p., 3 l., 17-289 p. illus. 8°.

NCC (Swinburne)

INDIVIDUAL BIOGRAPHY

BALLIN, Albert. Ballin; Leben und Werke eines deutschen Readers, von Peter Franz Stubmann... Berlin: H. Klemm [1926]. v, 305 p. illus. 8°.

AN

BOGDANOVICH, Aleksandra Viktorovna Buvrov. Journal de la générale A. V. Bogdanovitch; chronique du temps des trois derniers Romanof, traduite du russe par M. Letebvère. Paris: Payot, 1926. 320 p. 8°. (Collection de mémoires, études et documents pour servir à l'histoire de la guerre mondiale.)

AN

BRAMHALL, John. Archbishop Bramhall by W. J. Sparrow Simpson... London: Society for Promoting Christian Knowledge, 1927. 259 p. 12°. (English theologians.)

AN

BRYCE (viscount), James Bryce. James Bryce (Viscount Bryce of Dechmont, O.M.), by H. A. L. Fisher... London: Macmillan and Co., Ltd., 1927. 2 v. illus. 8°.

AN

COLLINS, Michael. Michael Collins and the making of a new Ireland, by Piaras Béaslaigh... London: G. G. Harrap & Co., Ltd. [1926.] 2 v. illus. 8°.

AN

COMSTOCK, Anthony. Anthony Comstock roundsman of the Lord, by Heywood Brown & Margaret Leech... New York: The Literary Guild of America, 1927. 285 p. illus. 8°.

AN

CRICHTON-BROWNE, Sir James. Victoria jottings from an old commonplace book, by Sir James Crichton-Browne... London: Etchells & Macdonald [1926]. vii, 344 p., port. 8°.

AN

DAVIES, Emily. Emily Davies and Girton College, by Barbara Stephen. London: Constable & Co., Ltd., 1927. xi, 387 p. illus. 8°.

AN

ELIOT, George, pseud. George Eliot and her times; a Victorian study by Elizabeth S. Haldane. London: Hodder and Stoughton, Ltd., 1927. viii, 315 p. illus. 8°.

AN

FAIRBRIDGE, Kingsley. The autobiography of Kingsley Fairbridge, with a preface by the Right Hon. L. S. Amery... and an epilogue by Sir Arthur Lawley... London: H. Milford, 1927. ix, 188 p. illus. 12°.

AN

FIELD, Eugene. Life of Eugene Field, the poet of childhood, by Slason Thompson. New York and London: D. Appleton and Company, 1927. xv, 407(1) p. illus. 8°.

AN

Individual Biography, continued.

GIBSON, Edmund. Edmund Gibson, bishop of London, 1669-1748; a study in politics & religion in the eighteenth century, by Norman Sykes... London: H. Milford, 1926. xxiv, 450 p. illus. 8°. **AN**

HUNT, Violet. I have this to say: the story of my flurried years, by Violet Hunt. New York: Boni and Liveright [cop. 1926]. ix p., 2 l., 3-306 p. illus. 8°. **AN**

KRUPP, Alfred. Alfred Krupp, von Wilhelm Berdrow... Berlin: R. Hobbing [cop. 1927]. 2 v. illus. 4°. **AN**

LINCOLN, Abraham. The military genius of Abraham Lincoln; an essay by Brigadier-General Colin R. Ballard... London: Oxford University Press, 1926. 246 p. illus. 8°. **AN**

MÉRIMÉE, Prosper. Prosper Mérimée, a mask and a face, by G. H. Johnstone... London: G. Routledge & Sons, Ltd. [1926.] x, 282 p., 1 port. 8°. **AN**

MORLEY (1st viscount), John Morley. Early life & letters of John Morley, by F. W. Hirst... London: Macmillan and Co., Ltd., 1927. 2 v. illus. 8°. **AN**

MORONES, Luis N. Morones of Mexico; a history of the labour movement in that country, by J. H. Retinger... London: The Labour Pub. Co., Ltd. [1926.] xvi, 107 p. 12°. **AN**

"This short account of the birth and triumph of an idea in a little known and much misunderstood country is the first history to be written of the Labour Movement of Mexico..." — *Introd. note.*

PAULING, George. The chronicles of a contractor; being the autobiography of the late George Pauling; edited by David Buchan, with an introduction by J. O. P. Bland. London: Constable & Co., Ltd., 1926. xii, 240 p., 1 port. 8°. **AN**

POLE, Reginald, cardinal. Cardinal Pole and his early friends, by Cardinal Gasquet. London: G. Bell and Sons, Ltd., 1927. 116 p. 12°. **AN**

SHEPHERD, James. Shepherd of Udaipur and the land he loved, by George Carstairs... London: Hodder and Stoughton, Ltd. [1926.] xi, 307 p. illus. 12°. **AN**

TROLLOPE, Anthony. Trollope; a commentary, by Michael Sadleir. London: Constable & Co., Ltd., 1927. ix, 432 p. illus. 8°. **AN**

AMERICA

Auchampaugh, Philip Gerald. James Buchanan and his cabinet on the eve of secession... Privately printed. [Lancaster, Pa.: Lancaster Press, Inc.,] 1926. ix, 224 p., 1 port. 8°. **IIR**

Beard, Charles Austin, and MARY R. BEARD. The rise of American civilization... Decorations by Wilfred Jones... New York: The Macmillan Company, 1927. 2 v. 8°. **IAE**

Becker, Carl. The spirit of '76, and other essays, by Carl Becker, J. M. Clark, William E. Dodd. Washington: The Robert Brookings Graduate School of Economics and Government, 1927. 4 p.l., 9-135 p. 12°. **IG**

Bemis, Samuel Flagg, editor. The American secretaries of state and their diplomacy... J. Franklin Jameson, H. Barrett Learned, James Brown Scott, advisory board. v. 1-3. New York: A. A. Knopf [1927]. 8°. **IC**

Cundall, Frank. The Darien venture... New York: Printed by order of the trustees, 1926. 2 p.l., v-ix p., 1 l., 3-155 p. illus. 16°. (Hispanic notes and monographs.) **HDB**

Funke, Alfred. Brasilien im 20. Jahrhundert. Berlin: R. Hobbing [1927]. 435 p. illus. 8°. **HFY**

Hancock, Samuel. The narrative of Samuel Hancock, 1845-1860, with an introduction by Arthur D. Howden Smith, and a map of the Oregon trail. New York: R. M. McBride & Co., 1927. 2 p.l., v-xxii, 217 p. 8°. **AN**

Hill, Howard Copeland. Roosevelt and the Caribbean. Chicago, Ill.: The University of Chicago Press [1927]. 3 p.l., vii-xi, 232 p., 1 l. 8°. **ICI**

Lathrop, Elise L. Early American inns and taverns. New York: R. M. McBride & Co., 1926. xxi p., 2 l., 25-365 p. illus. 8°. **IAG**

McMaster, John Bach. A history of the people of the United States during Lincoln's administration... New York: D. Appleton and Co., 1927. xxxi, 693 p. maps. 8°. **IK**

Marshall, Charles. An aide-de-camp of Lee, being the papers of Colonel Charles Marshall, sometime aide-de-camp, military secretary, and assistant adjutant general on the staff of Robert E. Lee, 1862-1865, edited by Major General Sir Frederick Maurice... Boston: Little, Brown, and Co., 1927. xxix, 287 p. illus. 8°. **IKC**

Mason, Gregory. Silver cities of Yucatan. With a preface by Dr. Herbert J. Spinden... New York: G. P. Putnam's Sons, 1927. 3 p.l., v-xvii, 340 p. 8°. **HTTF**

Nathan, George Jean. The new American credo; a contribution toward the interpretation of the national mind... Completely revised and enlarged edition. New York: A. A. Knopf, 1927. xii p., 1 l., 223 p., 1 l. 12°. **ILH**

America, continued.

Nordenskiöld, Erland, friherre af. Indianliv i El Gran Chaco (Syd-Amerika). Stockholm: Åhlens & Åkerlunds förlag [1926]. 251 p. illus. 8°. **HBC**

Sears, Louis Martin. Jefferson and the embargo... Durham, N. C.: Duke University Press [cop. 1927]. ix p., 2 l., 3-340 p. 8°. (Duke University publications.) **II**

Siegfried, André. America comes of age, a French analysis; translated from the French by H. H. Hemming and Doris Hemming. New York: Harcourt, Brace and Co. [cop. 1927.] x, 358 p. illus. 8°. **IAG**

Stryker, William Scudder. The battle of Monmouth; edited by William Starr Myers. Princeton: Princeton University Press, 1927. 5 p.l., 303 p. illus. 8°. **IGE**

Taylor, Alruthus Ambush. The negro in the reconstruction of Virginia. Washington, D. C.: Association for the Study of Negro Life and History [cop. 1926]. iv, 300 p. 8°. **IEC**

Walling, William English. American labor and American democracy. New York and London: Harper & Bros., 1926. ix p., 1 l., 184 p. 8°. **IBZ**

Wilson, Henry Lane. Diplomatic episodes in Mexico, Belgium and Chile... Garden City: Doubleday, Page & Co., 1927. xvii, 399 p. 8°. **ICM (Mexico)**

Wright, Richardson Little. Hawkers & walkers in early America, strolling peddlers, preachers, lawyers, doctors, players, and others, from the beginning to the Civil war... Philadelphia: J. B. Lippincott Co., 1927. 317(1) p. illus. 8°. **IDS**

JUDAICA, HEBRAICA, ETC.

Abraham, Meyer, editor. Légendes juives apocryphes sur la vie de Moïse... Paris: P. Geuthner, 1925. 113 p. 8°. ***PDY**
Includes bibliographies.

Contents: Avant-propos. Bibliographie générale. La chronique de Moïse. L'ascension de Moïse. La mort de Moïse. La chronique de Moïse: d'après la traduction de Paul Paradis (1539). L'Ascension de Moïse [translation]. La mort de Moïse [translation]. Additions et rectifications.

Abrahams, Israel. Campaigns in Palestine from Alexander the Great. London: H. Milford, 1927. x, 55 p. illus. 8°. (British Academy, London. The Schweich lectures. 1922.) ***PXH**

Berdyczewski, Micha Joseph, compiler. Messias-Legenden, gesammelt von Micha

Josef bin Gorion [pseud.]. Tübingen: A. Fischer, 1926. 63 p. 12°. ***PNW**

"Aus dem Nachlass des Sammlers herausgegeben und übersetzt von Rahel Ramberg."
"Quellen und Anmerkungen": p. 61-63.

Berl, Heinrich. Das Judentum in der Musik. Stuttgart: Deutsche Verlags-Anstalt, 1926. 240 p. 8°. ***PVC**

Bernstein, F. Der Antisemitismus als Gruppenercheinung; Versuch einer Soziologie des Judenhasses. Berlin: Jüdischer Verlag, 1926. 222 p. 8°. ***PZD**

Bertholet, Alfred. A history of Hebrew civilization. Translated by the Rev. A. K. Dallas... London: G. G. Harrap & Co. Ltd. [1926.] 399 p. 8°. ***PE**

Bibliographical footnotes.

Elwenspoeck, Curt. Jud Süß Oppenheimer, der grosse Finanzier und galante Abenteuerer des 18. Jahrhunderts; erste Darstellung auf Grund sämtlicher Akten, Dokumente, Überlieferungen von Dr. Curt Elwenspoeck... Stuttgart: Süddeutscher Verlagshaus G.m.b.H., 1926. 192 p. illus. 12°. (Zeiten und Schicksale.) ***PWZ**

Bibliography, p. 191-192.

Jews.—Liturgy and Ritual: Zemirot Mediaeval Hebrew minstrelsy. Songs for the bride queen's feast; sixteen Zemirot arranged according to the traditional harmonies, by Rose L. Henriques. Illustrated by Beatrice Hirschfeld and translated into English to fit the Hebrew tunes, by Herbert Loewe; with a foreword by the Very Rev. Dr. J. H. Hertz... London: J. Clarke & Co., Ltd., 5687 (1926). 134, [3] p. illus. 8°. ***PKZ**

Last 3 pages are "Selected variant readings" in facsim.

Bibliography, p. 120.

Jiskor; ein Buch des Gedenkens an gefallene Wächter und Arbeiter im Lande Israel; deutsche Ausgabe mit einem Geleitwort von Martin Buber. Berlin: Jüdischer Verlag, 1920. 223 p. illus. 2. ed. 8°. ***PWR**
"Aus dem Hebräischen und Jidischen übersetzt von N. N."

The first ed., in Hebrew, was published in 1912. The Yiddish ed., issued during the war, was published by the Palestine Committee of Poale Zion. The German translation is based on these two editions with the addition of some material reprinted from the periodical "Hapoël Hazair."—cf. p. 206.

Kittel, Gerhard. Die Probleme des palästinischen Spätjudentums und das Urchristentum. Stuttgart: W. Kohlhammer, 1925. 200 p. 8°. (Beiträge zur Wissenschaft vom alten und neuen Testament. Folge 3, Heft 1.) ***PGF**

Bibliographical footnotes.

Lichtenstein, Morris. Peace of mind Jewish science essays. New York: Jewish Science Publishing Co., 1927. 358 p. 12°. ***PVI**

Judaica, Hebraica, etc., continued.

Margolis, Max Leopold, and ALEXANDER MARK. A history of the Jewish people. Philadelphia: The Jewish Publication Society of America, 1927. xxii, 823 p., 1 l. tables, maps. 8°. *PXE

Bibliography: p. 739-752.

Michelson, H. The Jew in early English literature. Amsterdam: H. J. Paris, 1926. viii, 175 p. illus. 8°. *PZB

Bibliography: p. 174-175.

Moore, George Foot. Judaism in the first centuries of the Christian era, the age of the tannaim. Cambridge: Harvard University Press, 1927. 2 v. 8°. *PNC

Morais, Sabato. Italian Hebrew literature... edited by Julius Greenstone, with a foreword by Henry S. Morais. New York: Jewish Theological Seminary of America, 1926. 244 p., 1 port. 8°. *PAX

Much, Hans. Rings um Jerusalem. Dachau bei München: Einhornverlag [1925]. 113 p. illus. 8°. *PWC

National Farm School Conference, New York, 1926. An American contribution, a resumé of the National Farm School Conference, Hotel Biltmore, June 2-7, 1926. New York, cop. 1926. 148 p. illus. 4°. *PYM

The school is a non-sectarian institution founded by Jews, and largely supported by Jewish capital. — *cf.* p. 16.

Samuel, Maurice. I, the Jew. New York: Harcourt, Brace and Company [cop. 1927]. viii, 275 p. 8°. *PWZ

Scholem, Gerhard, editor. Bibliographia Kabbalistica; Verzeichnis der Gedruckten, die jüdische Mystik (Gnosis, Kabbala, Sabbatianismus, Frankismus, Chassidismus), behandelnden Bücher und Aufsätze von Reuchlin bis zur Gegenwart, mit einem Anhang: Bibliographie des Zohar und seiner Kommentare, von Gerhard Scholem... Leipzig: W. Drugulin, 1927. xviii, 230 p. 4°. (Quellen und Forschungen zur Geschichte der jüdischen Mystik. Bd. 2.)

*PQC (Quellen)

Added t.-p. reading: Kabbala; Quellen und Forschungen zur Geschichte der jüdischen Mystik.

Weill, Julien. La foi d'Israel; essai sur la doctrine de judaïsme... Paris: Presses universitaires de France, 1926. 178 p. 12°.

*PNG

Zohar. Kabbala denudata; the Kabbalah unveiled, containing the following books of the Zohar: 1. The book of concealed mystery. 2. The greater holy assembly. 3. The lesser holy assembly. Translated into English from the Latin version of Knorr von Rosenroth, and collated with the original Chaldee and Hebrew text, by S. L. MacGregor Mathers... London: K. Paul, Trench, Trubner & Co., Ltd., 1926. xiii, 360 p. illus. 8°. *PQG

CIRCULATION STATISTICS FOR THE MONTH OF AUGUST, 1927

BRANCHES	CIRCULATION		NEW REGISTRA- TIONS	VOLUMES ACCES- SIONED
	HOME USE (VOLUMES)	READERS OF REFERENCE BOOKS		
MANHATTAN				
Central Building:				
Central Circulation-----	49,874	---	696	383
Children's Room-----	2,323	2,878	39	67
Extension Division*-----	32,629	---	589	753
Library for the Blind-----	3,580	---	9	283
East Broadway, 33-----	7,766	623	28	568
East Broadway, 192-----	20,168	857	231	1,263
Rivington street, 61-----	14,224	---	124	520
East Houston street, 388-----	17,094	1,534	117	1,514
Leroy street, 66-----	8,477	241	77	253
8th street, 135 Second avenue-----	10,353	367	76	47
10th street, 331 East-----	20,603	219	181	283
13th street, 251 West-----	8,487	1,388	109	105
23rd street, 228 East-----	8,302	466	99	365
23rd street, 209 West-----	8,854	1,954	144	600
36th street, 303 East-----	5,427	483	56	52
40th street, 457 West-----	6,377	184	83	275
50th street, 564 Lexington avenue-----	5,921	309	66	337
51st street, 742 Tenth avenue-----	9,404	119	84	425
58th street, 121 East-----	10,625	800	167	231
58th " 121 " Music Library-----	1,705	1,199	---	186
67th street, 328 East-----	12,009	1,097	127	408
69th street, 190 Amsterdam avenue-----	10,237	415	173	422
77th street, 1465 Avenue A-----	12,302	100	72	137
79th street, 222 East-----	14,480	511	144	959
81st street, 444 Amsterdam avenue-----	12,612	1,036	196	383
96th street, 112 East-----	22,265	1,703	162	487
100th street, 206 West-----	16,412	329	219	197
110th street, 174 East-----	19,166	848	167	346
115th street, 203 West-----	14,274	197	172	87
124th street, 9 West-----	9,767	285	127	134
125th street, 224 East-----	7,232	216	92	25
125th street, 518 West-----	14,259	726	144	113
135th street, 103 West-----	9,443	3,299	127	535
145th street, 503 West-----	17,279	1,120	245	425
St. Nicholas avenue, 1000-----	13,802	701	137	295
179th street, 535 West-----	22,215	838	256	320
THE BRONX				
140th street, 321 East-----	18,337	1,187	219	531
Morris avenue, 910-----	14,503	574	159	146
160th street, 761 East-----	31,123	2,544	381	1,852
168th street, 78 West-----	9,470	1,030	133	278
169th street, 610 East-----	30,502	786	488	335
176th street and Washington avenue-----	35,084	2,432	535	1,932
Bainbridge avenue, 2556-----	29,631	1,135	371	384
Kingsbridge avenue, 3041-----	5,601	458	53	68
RICHMOND				
St. George-----	7,933	1,416	171	69
Port Richmond-----	11,231	439	155	297
Stapleton-----	7,856	192	78	111
Tottenville-----	4,053	14	28	37
1 Totals-----	685,271	39,249	8,306	19,772

* In addition 189 books were read at agencies of the Extension Division.

PRINCIPAL DONORS IN AUGUST, 1927

	VOLS.	PMS.		VOLS.	PMS.
American Art Association	41	41	Hungary-Nemzetgyűlés-Assem- blée Nationale	14	
American Chamber of Com- merce of Tientsin		1	Illinois State Library (2 maps)	13	30
Amherst College	1		India. Bihar & Orissa. Govern- ment Printer	1	10
Arizona State Library	3	6	Insurance Society of New York (151 periodicals)		
Bahamas. The Colonial Secre- tary	1		International Silver Company . .	2	3
Banco Central de Chile		7	Italy. Ministero della Marina. Ufficio del capo di Stato Mag- giore delle R. Marina	7	15
Barnes, Dr. L. C.	1	3	Kahoe & Spieth	1	
Bologna (Prov. Italy)—Con- siglio Provinciale	28	21	Kendall, Miss Georgiana (12 posters, 9 sheets)		54
Bookfellows	1		Li Siao-Yuen, University of Nanking		1
Brantford, Canada. City Clerk .	1		López, Señor Jacinto (232 peri- odicals)	6	6
British Museum		2	Marshall, Henry Rutgers	3	
Brooks Brothers	29	2	Martyn, Charles	4	2
Campbell, Herbert	1	1	Marx-Engels-Institut	26	79
Cha, Lincoln H.	1		Mexico. Departamento de la Estadística Nacional	10	9
Chicago Architectural Exhibition League	1		Minnesota. Secretary of State .	10	
Chile. Biblioteca Nacional . . .	10	13	Moyer, Fayette E.	4	5
Clemen, Rudolf A. Armour's Livestock Bureau		1	National Bureau of Economic Research	1	
Cohn, Dr. Michael A.		2	Neighborhood Playhouse (1 periodical)	10	4
Coleman, Edward D.	28		New York Edison Company . . .	1	
Commission Financière Inter- nationale d'Athènes		1	New York Times (87 maps) . . .		3
Cooke, Mrs. Helen M.		1	Nova Scotia. King's Printer . .	2	
Cuvillier, Hon. Louis A. (2 peri- odicals, 20 sheets, 9 news- papers)	1	14	Palma de Mallorca. Camara Provincial de Comercio	1	
de Haas, Jacob	2		Post, Louis F.	1	
de Kay, John		1	Pradon, Henri	23	12
Dies, Edward Jerome	1		Reeve, Dr. Sidney A. (1 typed manuscript)		
Dresdner Bank		6	Reitmeister, Louis A.	1	
Endicott-Johnson Corporation . .		1	Saper, Mrs. Hattie		28
Engineering Societies Library (144 periodicals, 121 maps) . .	414	1,115	Scheidenhelm, F. W.	1	
Fay, Spofford & Thorndike . . .	2		Simões, João da Matta	5	6
Felton Bequests Committee . . .		1	Smith, Mrs. George W. (1 peri- odical, 141 maps)	21	14
Fisher, Marian Cole	1		Sneddon, Miss Jean	55	2
Foshay, Estate of Arianna S. . .	2		Tasmania. House of Assembly .	2	
Fox, Selden C.		1	Tejada, J. de D.	1	
General Education Board (98 periodicals, 5 newspapers) . . .	50	101	Tokyo Asahi & The Osaka Asahi .	1	
Gold Coast Colony. The Col- onial Secretary	1		Turkey. Ministre des Finances .	1	
Gravure (La), Originale en Noir, Société Internationale (7 cards, 2 menus, 1 etching) .		6	Union of the Macedonian Politi- cal Organizations of the U. S. A. and Canada		6
Great Western Railway	1		Webster Mrs. A. L. (6 sheets)	17	
Historical and Scientific Society of Manitoba		1	West Virginia Bar Association .	15	
Howell, John W., and Henry Schroeder	1		Young, Owen D.		2

PUBLICATIONS OF THE NEW YORK PUBLIC LIBRARY

(Now in Print)

HISTORY AND GUIDES

History of The New York Public Library, by H. M. Lydenberg. 1923	PRI	\$2.00
Handbook of The New York Public Library		.25
Facts for the Public		.60
Central Building Guide		.60
Questions About Your Library (General Information about the Library)	Fr	
For Sightseers. Central Building	Fr	

PERIODICALS

Annual Report of The New York Public Library. (A limited number are given free upon request.)

Bulletin of The New York Public Library. Published monthly. Chiefly devoted to the Reference Department. Bibliography, news of the Library, reprints of manuscripts, descriptions of new accessions. \$1.00 a year; current single numbers for 10 cents. Back numbers at advanced rates.

Branch Library Book News. A selected list of new additions to the Circulation Department, with other lists and articles. Published monthly, except in July and August. For sale at the Branches and at the Inquiry Desk. 2 cents a copy; 25 cents a year, postpaid.

New Technical Books. A selected list of books on industrial arts and engineering recently added to the Library. Published quarterly. 25 cents a year, postpaid.

Municipal Reference Library Notes. Published weekly except during July and August for circulation among the officials and employees of the City of New York. Price: \$2.00 a year; 5 cents a copy. Apply at Room 512, Municipal Building.

LIST OF BOOKS IN THE LIBRARY RELATING TO VARIOUS TOPICS, TEXTS PRINTED FROM MANUSCRIPTS OWNED BY THE LIBRARY, ETC.

REFERENCE DEPARTMENT

	PRICE		PRI
Almanacs, A list of New York, 1694-1850. 1921	1.00	Avery Collection, Handbook of— Supplement: Additions of Prints, 1901-1920. 1921	
American Interoceanic Canals. A list of references. 1916	.30	Avesta and Romani, by Albert Thomas Sinclair. 1916	
American-Romani Vocabulary, by Al- bert Thomas Sinclair. 1915	.05	Beadle Collection of Dime Novels. 1922	
Armenia and the Armenians. A list of references. 1919	.30	Beaumarchais, Editions of, in New York City. 1925	
Article of Faith, An, by Hiller C. Wellman. 1919	.05	Berlin and the Prussian Court in 1798. From a ms. journal of Thomas Boylston Adams. 1916	
Assyria and Babylonia. A list of refer- ences. 1918	.45	Billings, Dr. John Shaw, Memorial Meeting in honor of the late. 1913	
Astor Library, Catalogue of the. 8 vol- umes. Sewed. Per volume	5.00	British Genealogy and Local History, List of works relating to. 1910	1.
Automobile Tires. A list of refer- ences. 1923	.10	City Planning and Allied Topics, Se- lect list of works relating to. 1913	
Avery Collection, Handbook of. 1901. 84 p.	.50		

	PRICE		PRICE
Clinton, General George, Calendar of Messages & Proclamations of, 1777-1781. 1927	.25	Historical Prints and Early Views of American Cities. Catalogue of exhibition. 1917	.05
Color Photography. 1924	.75	Holcroft, Thomas, A Bibliography of. By Elbridge Colby. 1922	.60
Columbus. Letter of Columbus on the discovery of America. Facsimile of the pictorial edition, with a new and literal translation, and a complete reprint of the four oldest Latin editions. 1892. Cloth	.50	Holt, John — Printer and Postmaster. 1920	.10
Commencement Addresses by Stephen H. Olin and Carl B. Roden. 1924	.10	Hudson, Henry, The Hudson River, Robert Fulton and Steam Navigation, List of prints, books, manuscripts, etc., relating to. 1909	.30
The Compensations, by Asa Don Dickinson. 1922	.05	A Hundred Years of Grand Opera in New York, 1825-1925. A record of performances. 1927	1.00
Cruise of the U. S. Brig <i>Argus</i> in 1813. Journal of Surgeon James Inderwick. 1917	.10	The Illustrated Book. Notes on an exhibition. 1919	.15
Druids and Druidism. A list of references. 1920	.05	Illustrated Books of the Past Four Centuries. A record of the exhibition in 1919. 1920	.50
Early American Children's Books, 1682-1840. 1927	.05	Inks, Chemistry and Manufacture of. 1926	.75
Early American Poetry, 1610 to 1820. A list of works. 1917	.20	Insulating Oil. A list of references. 1927	.50
Early Library Development in New York State. By George Watson Cole. 1927	.10	Inventory of the Rensselaerswyck Manuscripts. 1924	.25
Echo-Device in Literature. By Elbridge Colby. 1920	.25	Irvingiana, The Seligman Collection of. 1926	.25
Egypt, Ancient. Sources of information. 1925	2.75	Isle de Bourbon (Réunion) Documents, 1701-1710. Printed from the original manuscript in the Library. 1909	.20
Emmet Collection of Mss., Prints, etc., Catalogue of. Sheets. 1900	5.00	Japanese-American Relations. A list of works. 1921	.40
Eno Collection of New York City Views. 1925	.75	The Jewish Division in the Reference Department. 1926	Free
Flatboating on the Yellowstone, 1877. By Fred G. Bond. 1925	.25	Jewish Life in Oriental Countries. A list of books and manuscripts exhibited. 1927	.10
Folk Music of the Western Hemisphere. 1925	.50	Journalism. A bibliography. 1924	2.00
Gardens & Gardening. A selected list of books. 1927	.10	Joys of Librarianship, by Arthur E. Bostwick. 1918	.05
Geology, Mineralogy and Palæontology of New Jersey, List of works on. 1916	.15	Kennan Collection. By Abraham Yarmolinsky. 1921	.10
Greenwood, John, an American-born Artist. 1927	.25	Latin-American Periodicals Current in the Reference Department. 1920	.05
Gypsies in Carniola and Carinthia, by Albert Thomas Sinclair. 1917	.05	Letters of American Clergymen, 1711 to 1860. 1917	.05
Gypsies of Monastir, by Rev. Lewis Bond. 1917	.05	Letters of American Physicians and Surgeons. 1919	.05
Henry George and the Single Tax. 1926	.50	The Librarian Himself, by H. L. Koopman. 1916	.05
Heritage of the Modern Printer, by Margaret B. Stillwell. 1916	.05	Librarian as a Unifier, by Andrew Keogh. 1915	.05
Historical Printing Club, Publications of the. (List and prices furnished upon application.)		Library Tonic, by George Parker Winship. 1917	.05
		Lycanthropy. A list of works. 1920	.05

	PRICE		PRICE
Macpherson's Ossian and the Ossianic Controversy. A contribution towards a bibliography. 1926	.25	Shakespeareana, Catalogue of Exhibition of, compiled by Henrietta C. Bartlett. 1916	1.00
The Manuscript Division, by Victor Hugo Paltsits. 1915	.15	The Soul of the Library, by J. I. Wyer. 1923	.00
Mountaineering. Selected list. 1916	.05	Spalding Baseball Collection. 1922	.20
Music Publishers in New York City before 1850. A directory. 1917	.10	Stauffer Print Collection, by Charles Allen Munn. 1916	.00
Nationalization of Coal Mines. 1920	.10	Storage Batteries. A list of references, 1900-1915. 1915	.10
Naval Architecture and Shipbuilding. A list of references. 1919	.20	Submarines. A list of references. 1918	.30
The New York Public Library and the Business Man. 1923	Free	Superstructures, by W. N. C. Carlton. 1918	.00
The New York Tercentenary. An exhibition of the history of New Netherland, 1524-1674. 1926	.30	Tilden, S. J. Letters and Literary Memorials, edited by John Bigelow. 2 v. 1908	6.00
Newspapers and Official Gazettes, Checklist of. 1915	1.85	Tilden, S. J. Writings and Speeches, edited by John Bigelow. 2 v. 1885	6.00
Numismatics. List of works. 1914	.65	Timothy Dexter and His "Pickle for the Knowing Ones." 1922	.10
Opera Plots, Index to. 1927	.75	To Nebraska in '57. A Diary of Erasmus F. Beadle. 1923	2.00
Orlando Gibbons Tercentenary, by Jeffrey Mark. 1926	.15	Torpedoes. A list of references. 1917	.30
Oxy-Acetylene Welding. List. 1914	.15	The Walt Whitman Exhibition. By Emory Holloway. 1925	Free
Pageants in Great Britain and the United States. A list of references 1916	.15	War Memorials. A list. 1919	.00
Paintings, Catalogue of, in the picture galleries of the Library. 1927	.10	War Taxation, 1914-1917. A list of references. 1917	.00
Persia, List of works relating to. 1915	.50	Washington Eulogies. A checklist. 1916	.20
The Photostat in Reference Work. 1925	.15	Washington's Note Book. Selections from a newly discovered manuscript, edited by Victor Hugo Paltsits. 1920	.00
The Pitcairn Bible. 1924	.15	What Did Macaulay Say About America? Text of four letters to Henry S. Randall. 1925	.40
Prints and their Production: Supplement. 1917	.05	What's the Matter with the Public Library? By E. L. Pearson. 1922	Free
Provençal Literature & Language. 1925	3.00	Why They Came to the Library. 1920	Free
Robinson Locke Dramatic Collection. 1925	.10	Winthrop, Theodore, Bibliographical notes on, by Elbridge Colby. 1917	.00
Romani and Dard, by George F. Black. 1916	.05	Winthrop Books, Plates of the, by Elbridge Colby. 1918	.00
Russian, other Slavonic and Baltic Periodicals, A list of. 1916	.15		
Schoolroom Decoration. A list of references. 1917	.05		
Scotland. A list of works. 1916	3.00		
Selenium. A list of references, 1817-1925. 1927	.65		

MUNICIPAL REFERENCE LIBRARY

Publications to be obtained at the Municipal Reference Library, Room 512, Municipal Building.

Guide Posts on the Road to Health; A list of books	PRI
Teaching Citizenship via the Movies. A survey of civic motion pictures	
Visualizing Citizenship	
What to Read on New York City Government. A list of references	.00

CIRCULATION DEPARTMENT

Publications to be obtained at any Branch Library, or from the Chief of the Circulation Department,
476 Fifth Avenue. Publications given free unless otherwise stated.

Branch Library Book News. *See* Periodicals.

LISTS OF BOOKS FOR ADULTS

Altman Collection

Books of Interest to Women Voters

Catalogue of Books for the Blind in Revised Braille. Grades One, Two and Three. November, 1921; Supplements, December, 1922, January, 1925

Catalogue of Books for the Blind in Revised Braille. Grade One-and-a-Half. November, 1921; Supplements, October, 1924; May, 1925

Catalogue of Books for the Blind in the Moon type. November, 1921; Supplements, December, 1922, October, 1924.

Catalogue of Music Scores in the Braille Type. July, 1922; Supplement, October, 1926.

Christmas Exhibit

Current Periodicals and Newspapers on File at the Branches

Fairy Tales for Grown-up Readers

List of Piano Music

Military Training

"The New York of the Novelists"

Old-Fashioned Novels

Plays of Thirteen Countries

Poetry of the Supernatural

Polish Book List

Romans à Clef; A List of Novels with Characters based on Real Persons. 2 cents

Sailor's Yarns. 2 cents

Stories of Romance and Imagination

Stories of the Sea. 5 cents

Supplement to the Catalogue of Music for the Blind. Music Scores in the American Braille and New York Point Types

Wanderers and Vagabonds

LISTS FOR CHILDREN

Favorite Stories of the Library Reading Clubs

Journeys to Foreign Lands

LISTS FOR ADULTS AND CHILDREN

New York City and the Development of Trade

Sea and Shore

The Shakespearian Festival

BOARD OF TRUSTEES

W. VINCENT ASTOR
 GEORGE F. BAKER, JR.
 SAMUEL GREENBAUM
 EDWARD S. HARKNESS
 PATRICK CARDINAL HAYES
 ARTHUR CURTISS JAMES

GRENVILLE KANE
 LEWIS CASS LEDYARD
 JOHN G. MILBURN
 J. PIERPONT MORGAN
 MORGAN J. O'BRIEN
 WILLIAM BARCLAY PARSONS

FRANK L. POLK
 ELIHU ROOT
 EDWARD W. SHELDON
 I. N. PHELPS STOKES
 HENRY WALTERS
 BRONSON WINTHROP

JAMES J. WALKER, Mayor of the City of New York, *ex officio*
 CHARLES W. BERRY, Comptroller of the City of New York, *ex officio*
 JOSEPH V. MCKEE, President of the Board of Aldermen, *ex officio*

OFFICERS

President, LEWIS CASS LEDYARD, 476 Fifth Avenue.

First Vice-President, ELIHU ROOT.

Second Vice-President —

Secretary, FRANK L. POLK.

Treasurer, EDWARD W. SHELDON, 45 Wall Street.

Assistant Treasurer, UNITED STATES TRUST COMPANY, 45 Wall Street.

Director, EDWIN H. ANDERSON, 476 Fifth Avenue.

Chief Reference Librarian, H. M. LYDENBERG, 476 Fifth Avenue.

Chief of the Circulation Department, FRANKLIN F. HOPPER, 476 Fifth Avenue.

Editor, ROBERT R. FINSTER, 476 Fifth Avenue.

BUILDINGS AND BRANCHES

CENTRAL BUILDING, 476 Fifth Avenue, contains general administrative offices of the whole system, all Divisions of the Reference Department, and the Central Circulation Branch, Central Children's Room, Library for the Blind, and the Extension Division.

MUNICIPAL REFERENCE BRANCH, Room 512, Municipal Building. (Free for reference.)

CIRCULATION BRANCHES

MANHATTAN

33 East Broadway. (Chatham Square.)
 192 East Broadway. (Seward Park.)
 61 Rivington Street.
 388 E. Houston St. (Hamilton Fish Park.)
 66 Leroy Street. (Hudson Park.)
 135 Second Avenue. Near Eighth Street.
 (Ottendorfer.)
 331 East 10th Street. (Tompkins Square.)
 251 West 13th Street. (Jackson Square.)
 228 East 23rd Street. (Epiphany.)
 209 West 23rd Street. (Muhlenberg.)
 303 East 36th Street. (St. Gabriel's Park.)
 457 West 40th Street.
 564 Lexington Avenue. (Cathedral.)
 742 Tenth Avenue. Near 51st Street.
 (Columbus.)
 121 East 58th Street.
 328 East 67th Street.
 190 Amsterdam Avenue. Near 69th Street.
 (Riverside.)
 1465 Avenue A. Near 78th St. (Webster.)
 222 East 79th Street. (Yorkville.)
 444 Amsterdam Avenue. Near 81st Street.
 (St. Agnes.)
 112 East 96th Street.
 206 West 100th Street. (Bloomingdale.)
 174 East 110th Street. (Aguilar.)
 203 West 115th Street.
 116th Street and Amsterdam Avenue. Room
 108a, Columbia University Library.
 (Columbia Sub-branch.)
 9 West 124th Street. (Harlem Library.)
 224 East 125th Street.
 518 West 125th Street. (George Bruce.)

103 West 135th Street.
 503 West 145th Street. (Hamilton Grange.)
 1000 St. Nicholas Avenue. Cor. 160th Street.
 (Washington Heights.)
 535 West 179th Street. (Fort Washington.)
 215 Sherman Avenue. Near 207th Street.
 (Inwood Sub-branch.)

THE BRONX

 321 East 140th Street. (Mott Haven.)
 761 East 160th Street. (Woodstock.)
 910 Morris Avenue. Corner 162nd Street.
 (Melrose.)
 78 West 168th Street. (High Bridge.)
 610 East 169th Street. (Morrisania.)
 1866 Washington Avenue. Cor. 176th Street.
 (Tremont.)
 80 West 181st Street. (University Heights.)
 Sub-branch.)
 1741 Wallace Ave. (Van Nest Sub-branch.)
 2556 Bainbridge Avenue. (Fordham.)
 3041 Kingsbridge Avenue. Near 230th Street.
 (Kingsbridge.)
 3917 White Plains Road. Near 223rd Street.
 (Williamsbridge Sub-branch.)
 325 City Island Avenue. (City Island Sub-branch.)

RICHMOND

5 Central Avenue, Staten Island.
 (St. George.)
 75 Bennett Street. (Port Richmond.)
 85 State Street. (West New Brighton.)
 Sub-branch.)
 132 Canal Street. (Stapleton.)
 7430 Amboy Road. (Tottenville.)
 56 Gifford's Lane. (Gr't Kills Sub-branch.)
 180 Rose Avenue. (New Dorp Sub-branch.)